

[COMMITTEE PRINT]

EXPORT CONTROLS, COMPETITIVENESS AND
INTERNATIONAL COOPERATION: A CRITICAL REVIEW

A SUMMARY AND ANALYSIS OF HEARINGS ON THE
NATIONAL ACADEMY OF SCIENCES REPORT ON
NATIONAL SECURITY EXPORT CONTROLS

STAFF REPORT

TO THE

COMMITTEE ON
SCIENCE, SPACE, AND TECHNOLOGY
HOUSE OF REPRESENTATIVES

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LETTER OF TRANSMITTAL

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, DC, February 3, 1989.

Members of the Committee on Science, Space, and Technology:

In the early months of the 100th Congress, considerable attention was focused on the issue of U.S. export controls. Support for the effective control of the export of those technologies which might be of military use to potential adversaries remained strong. But there was also an emerging concern that, in the administration of our export control laws, damage was being inflicted on the ability of American industry to compete in the world market in those cases where comparable technologies were freely available from firms in other countries.

In January 1987 the National Academy of Sciences completed a study of this issue, and our Committee held two days of hearings with the Academy study as the central focus. Testimony was taken from the Chairman, Dr. Lew Allen, and members of the Academy panel which performed the study, and from the Presidents of the Science and Engineering Academies, Dr. Frank Press and Dr. Robert White; and from a representative of the Department of Defense, Assistant Secretary Richard Perle. A representative of the Department of Commerce was invited to testify, but instead submitted a short statement.

At my request the Committee staff has prepared a report analyzing the testimony presented at our hearings and the content of the Academy's report. I submit herewith that staff report to the Members of the Committee for your consideration and use. The staff report includes an overview and background on the export control question, a summary of the Academy report, its findings and recommendations, an analysis of the cost-benefit study included in the Academy report, and certain conclusions that emerged from our hearings.

I commend this report to the attention of the Members of the Committee and to the attention of other Members of the House with an interest in this important issue.

ROBERT A. ROE, *Chairman.*

LETTER OF SUBMITTAL

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, DC, October 12, 1988.

Hon. Robert A. Roe,
Chairman, Committee on Science, Space, and Technology,
U.S. House of Representatives.

DEAR MR. CHAIRMAN: I submit herewith a report prepared by the Committee staff and entitled, "Export Controls, Competitiveness and International Cooperation: A Critical Review."

This report was prepared following the Committee's hearings on this subject in the First Session of the 100th Congress. It consists of an analysis of the many complex issues surrounding the nation's policies for the control of high technology products in a manner that maintains free trade wherever possible yet restricts the access to those technologies to potential adversaries for military uses.

In the preparation of this report the staff had the assistance of officials of the Department of Commerce, the Department of Defense, and most notably a number of experts at the National Research Council, the operating arm of the National Academy of Sciences. We extend to them our thanks for the extensive help they have provided in the preparation of this report.

Sincerely yours,

HAROLD P. HANSON, *Executive Director.*

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PREFACE

On February 4, 1987 and on April 23, 1987, the Committee on Science, Space, and Technology conducted two days of hearings on a major report issued by the National Academy of Sciences on "The Impact of National Security Controls on International Technology Transfer." The Committee found the Academy study helpful in understanding the many complex issues associated with export controls and the need to respond to the changing international trade environment if American industry is to remain competitive in the world market. The many recommendations in the Academy study address highly desirable goals, such as a streamlined licensing process and achieving effective multilateral control mechanism. However, the Committee is not prepared to endorse any specific recommendations in total at this time. Rather, through this analysis, it seeks to outline the context in which action may be taken.

During the hearings, Committee Members pursued at great depth the need for and means of achieving multinational harmony in the adoption, interpretation, and enforcement of national security export controls. The Committee observed a lack of compelling evidence about the question of whether or not the Coordinating Committee for Multilateral Export Control (COCOM) is a viable multinational control mechanism.

From this perspective, the Committee chose to leave open certain questions concerning the underlying premise of the Academy report which assumed the viability of COCOM as presently operating. Furthermore, mechanisms for obtaining greater multinational harmony were of particular Committee concern. For these reasons, the central theme of the hearings became an emphasis on international cooperation in multilateral agreements. Furthermore, the Committee did not discuss the issues regarding U.S. interagency balance in decision-making to any extent, unlike the considerable emphasis accorded these concerns in the Academy report.

Finally, perhaps the most widely quoted portion of the Academy report has been the quantitative analysis citing the impact of U.S. national security export controls on U.S. competitiveness in terms of lost sales and employment. The Committee examined closely the data in the Academy study and after a thorough vetting of the analysis in the Academy report, the Committee developed its own assessment, resulting in job loss estimates roughly 15% to 20% of the 188,000 suggested in the Academy report. Although the Committee's estimates of job losses are certainly not insignificant, they do differ by perhaps a factor of one-fifth from the estimates in the Academy report.

In the present report, the Committee on Science, Space, and Technology presents its conclusions and views resulting from the hearings, as well as a critique of the data analysis upon which the Academy report is based.

I. RECOMMENDATIONS

National security export controls have long been an essential mechanism for the denial of advanced technology to the Eastern Bloc. These controls are necessary. Efficient implementation requires both close interagency and multinational cooperation. Recent Legislative and Executive Branch initiatives have been undertaken to streamline the export licensing process within the U.S. Government. But disparities between the U.S. and other nations in the enforcement, compliance, and interpretation of export controls have placed U.S. industries at a competitive disadvantage with respect to foreign producers. As a result, the central issue is the pursuit of ways for enhancing international cooperation for a strengthened multinational export control system.

The need to remove these disparities, combined with the recognition of the global economy within which U.S. industries compete, requires a strong and uniformly-administered multinational export control system. Hence, the U.S. must place priority on developing and supporting an effective multilateral control system. Determinations to control specific technologies, or products, such as computers, semiconductors and machine tools, should be derived by balancing concerns for open technical exchange, economic vitality, and national security. Only technologies of strategic importance should be controlled, subject to multilateral agreement and consistent interpretation. Finally, U.S. Government agencies should place a priority on streamlining the license application process, in order to minimize the impact of these controls on U.S. and foreign businesses.

Based on the National Academy of Sciences report on the Impact of National Security Controls on International Technology Transfer and subsequent testimony, the following three recommendations are made:

- (1) Review interagency coordination and policy for the conduct of international scientific and technological cooperation. International cooperation may be both necessary and desirable for the successful conduct of big science initiatives, such as the space station and the superconducting super collider. However, arrangements for the protection and control of scientific exchange, as addressed by national security export controls on technical data exchange, must be negotiated in advance. In recent years, the U.S. has proven to be a not-always reliable partner, and this image must be dispelled by laying the ground work carefully for any international agreement. Early identification of a lead agency and clear interagency articulation of policy on each of these big science initiatives is essential for U.S. cooperative efforts. Furthermore, policy and criteria governing potential international technology cooperation, such as

consortia for semiconductor manufacturing processes, must be established;

(2) Enhance the technical support of the export control system by expanding the role of the National Bureau of Standards as the lead technical agency for license review and technology specification. This measure may attract and help retain greater technical expertise within the Commerce Department to negotiate technical interpretations with other agencies. Moreover, this proposal draws strongly upon NBS's close ties with industry and resident expertise in manufacturing and communications technologies; and

(3) Review the intent and enforcement of restrictions on unclassified technical data exchange as defined in DOD directive 5230.25 (which establishes policy, prescribes procedures, and assigns responsibilities for the dissemination and withholding of unclassified technical data) and the 1984 DOD Authorization Act. These interpretations have been identified as having a "chilling effect" on international scientific cooperation and technological advance.

II. INTRODUCTION

In January 1987, the findings of the National Academy of Sciences Panel on the Impact of National Security Controls on International Technology Transfer reached the media. A completed report, entitled, "Balancing the National Interest: U.S. National Security Export Controls and Global Economic Competition" was released in March. The study had its origin in the evolution of the U.S. military and competitiveness postures, as well as a specific 1984 legislative initiative.

A. BACKGROUND

U.S. military strategy has evolved since World War II. Today, the U.S. strategy is based on the premise that the U.S. and its allies can outperform potential adversaries technologically, using relatively smaller armed forces and not rely on time to mobilize a massive weapons manufacturing base. In order to pursue such a strategy, the U.S. must stay technologically ahead of the U.S.S.R.

There are several ways to stay ahead. One is to have an active R&D program. Another is to cooperate with our allies on advanced weapons developments. Yet another is to seek to deny, through such means as export controls, counterespionage, and security classification, access by the Eastern Bloc nations to advanced U.S. technology.

The National Academy of Sciences report was triggered, in part, by the realization that in the U.S., (1) the U.S. technological lead over the U.S.S.R. has declined in many fields and (2) the distinction between military and non-military technology is becoming blurred. As a result, two pressures have converged.

On the one hand, items of technology which have "dual-use", i.e., both military and civilian use, are subject to stringent U.S. export controls even though they also may be available from other countries. As a result, U.S. companies increasingly report lost sales on world markets because either (a) an export license is denied or, (b)

the time it takes to obtain a license in the U.S. is protracted in comparison with foreign competition. The result has been that pressure for the relaxation and/or streamlining of export controls and procedures has been exerted by the U.S. business community.

On the other hand, the recent advances in Soviet technology, both military (ICBM's, helicopters, submarines, etc.) and to a large extent, non-military technology (oil drilling equipment, power generation equipment, infrared sensors, etc.) have led to suggestions that in these areas, it serves little purpose to control exports of U.S. technologies, because such controls do not serve the original purpose of denying them to the Soviets—they already have them. Both of these pressures led, in general, to the idea of having the National Academy of Sciences conduct this study on export controls.

In 1984, the 98th Congress failed to reach agreement on amendments to the expired Export Administration Act of 1979. At the time, government and industry leaders expressed mounting concern about the apparent polarization of attitudes toward the national security export control issue and the emerging conflict between the national interest in maintaining military security and promoting international trade. These concerns were exacerbated by the demonstrated division within Congress over this issue. Trade associations representing those industries most affected by the controls (electronics, computers, and scientific instruments) formed the Industry Coalition on Technology Transfer to press the case for reform. This development, as well, contributed to the decision to ask the National Academy of Sciences to perform a study of these issues.

Organization of the Study

Financial support of the study came from many sources. Professional societies, industry associations, and U.S. corporations comprised the private organizations in support of this work. The following federal government agencies also provided support: the Department of Commerce, the Department of Defense, the Department of Energy, the Department of State, NASA and the National Science Foundation.

The members of the NAS panel which conducted the study were carefully selected. The panel composition included representation from academia, small and large business, and Federal agencies. A significant effort was made to have representation from people with experience in national security issues. Many of the 21 panelists, indeed, held positions at the highest levels of government. Among the panel members were: Chairman Lew Allen, Director of the NASA Jet Propulsion Laboratory and former Air Force Chief of Staff; B.R. Inman, former Director of the National Security Agency; Melvin R. Laird, former Secretary of Defense, Alexander Flax, President Emeritus of the Institute for Defense Analysis and former Secretary of the Air Force for Research and Development; and John S. Foster, Vice President for Science and Technology at TRW and former Director of Defense Research and Engineering at the DOD.

The Context for the Study

At the start of the 100th Congress the stage was set for a review of trade issues. Concern over U.S. competitiveness, in general, and high-technology competitiveness, in particular, fueled debates over proposed trade legislation. Specifically, the omnibus trade bill, H.R. 3 enjoyed strong support.

In January, 1987, the NAS report findings leaked to the press, which cited overcorrecting national security export controls as responsible for a \$9 billion dollar loss of U.S. sales and 188,000 lost jobs. Hence, the momentum of pending trade legislation coupled with the reports' findings regarding high technology export controls suggested an immediate review.

Committee hearings were held on February 4 and April 23, 1987. At the first hearing, Dr. Lew Allen presented the NAS Panel findings. Testimony from Mr. Richard N. Perle, Assistant Secretary of Defense for International Security Policy was heard on April 23.

B. PROBLEM DEFINITION

Appendix A of this report consists of excerpts of the principal findings of the NAS report. In general, the major problem, according to the NAS study, is a U.S. policy of overcontrol. Examples include:

(1) *Too many items are presently being controlled.*—The control list encompasses over 100 thousand items (an exact quantification is not available since controls are described by performance characteristics and specification). Also, indexing, the decontrol of items over time, has never been achieved. This aspect of overcontrol is perceived to dilute unnecessarily the control capabilities of the U.S. and our COCOM * partners by matching limited personnel for enforcement against an expanding list of proscribed products.

(2) *Procedures are cumbersome and do not work.*—Congressional intent on foreign availability has not been achieved, due in part to unclear interagency conflict-resolution procedures, resulting in protracted license application reviews, and too many licenses languishing or being denied. Lost corporate sales have resulted.

(3) *The strong presence of the Department of Defense in export control administration has created an imbalance between the concern for economic vitality and national security.*—The report notes that the DOD is involved unnecessarily in many licensing cases. For example, the DOD may exercise its option to review a license application for trade among free world countries for reason of risk of diversion. License applications subject to this review may involve products from a list of ten commodity categories, e.g. computers enroute to one of fifteen non-COCOM countries. The contention concerns the frequency with which the DOD exercises this authority.

(4) *Recent export control administration practices by the U.S. has eroded allied relations.*—The extraterritorial reach of export controls encountered as a consequence of reexport authorization requirements has frustrated both U.S. and foreign business. Demonstrated uses of foreign policy versus national security export con-

* See Appendix B.

trols have been confusing, with the appropriateness of applicability in question.

C. PROBLEM PERSPECTIVES

Beginning in 1981, the United States, led by the Department of Defense, undertook extensive initiatives to impede Eastern Bloc access to U.S. technology, consistent with the aforementioned strategy. It is generally accepted that greater levels of denial, relative to the pre-1981 "detente" period, were required. At the April 23 hearing, Secretary Perle testified that,

In 1981, shortly after taking office, we became aware through some quite extraordinary intelligence that was made available to this Government by a friendly government, of the remarkable extent to which the Soviet Union was utilizing Western technology in order to support its military program.

Indeed, the documentation that became available to us was so extraordinarily sensitive at the time that the number of officials in the Government permitted to examine it was limited to a handful outside the intelligence community group that performed an extensive analysis on it. The documentation revealed that there were then over 5,000 significant Soviet military projects that utilized Western technology.

In this quite remarkable documentation we were able to observe, project by project: the Soviet military program; the Western technology that was needed in order to bring it to fruition; the specific organization within the array of Soviet organizations devoted to this task that had been assigned responsibility for that particular acquisition, whether it was the KGB, or the GRU, or the Academy of Sciences, or some other organization; the hard currency budget available for the acquisition; the ruble budget available to support its acquisition; the status of the operation; and so forth.

It was quite an extraordinary display of the thoroughness with which the Soviets had familiarized themselves with Western technology and integrated its acquisition into their own military plans.

Indeed, that was perhaps the most striking message that came out of this documentation. It was that the Soviets were so certain of their ability to acquire technology, that they could confidently plan on that basis. I must say that the planning documents that we had were every bit as good as the planning documents that one expects to develop in the Department of Defense, where there are no obstacles to the procurement process of the kind that export controls are intended to impose on Soviet acquisition of Western technology.

Thus, in large measure, this discovery accounts for the vigor with which the Administration sought to reexamine the effectiveness of the existing system of controls, and its

renewed dedication to making that system of controls more effective.

Despite a consensus concerning the need for tighter controls in 1981, the energies and resources of the various agencies differed in pursuing these goals. Dr. Lew Allen, the NAS panel chairman stated, that

In effect, what has happened is that the Department of Defense has accepted the charge from the President to invigorate the system, and it has done so. In the process, it has simply outclassed the other agencies of Government in its personnel and financial resources and its bureaucratic skills, and, as a result, the other agencies of Government have become demoralized, and that has led to what we now believe is an unbalanced policy.

Two competing ideologies exacerbate these disparities among the Federal agencies in personnel and finances, complicating the implementation of export controls in Soviet technology denial. The following hypothetical scenarios describe the effects of these ideologies.

From a Department of Defense perspective, one might envision an enormous brick wall surrounding the U.S., the other COCOM countries, and additional free world allies, protecting all their military and dual use technologies from transfer to the Eastern Bloc. Only non-threatening technologies, for example, a hand saw, would be permitted to pass. In this scenario, the U.S. would presumably set the threshold for technology control. More specifically, the Office of the Assistant Secretary for International Security Policy of the Department of Defense would lead the negotiation. In this way, the U.S., led by the DOD, would elevate and make uniform, negotiated technology thresholds. These thresholds on technologies and products would then be employed throughout COCOM and in other bilateral agreements, resulting in a synergistic multilateral control mechanism.

The second perspective may be illustrated by replacing the tall brick wall of the first scenario with a modest height brick fence and larger gate. This embodiment assumes that COCOM technology controls would remain more liberal than those currently associated with the U.S. Department of Defense. In this case, the U.S. would step closer to existing COCOM technology control criteria, in an effort to preclude unfair penalties to U.S. commercial industries and noting that U.S. industry denial in these market places would only strengthen foreign industries. This multilateral mechanism would control a smaller set of higher criticality technologies. For example, high-tech commodities, such as personal computers, which are non-critical and are widely available from many countries without any export restrictions, would not be embargoed, although mainframe computers would be. Hence, national security would be enhanced in two ways. First, more effective controls could be administered across a smaller number of most critical technologies. Second, increased economic vitality, associated with opening some foreign markets, would further stimulate innovation. This scenario includes the Department of Commerce as the authority re-

sponsible for implementing the appropriate balance in negotiations with COCOM.

In reality, the present industry perception of export controls and related complexities are described by a third perspective. In this instance, two primary domains control their indigenous dual-use products with significantly different thresholds. One can envision COCOM dual-use technology, protected by a relatively low brick fence, focusing on a relatively small list of critical technologies. At the same time, U.S. dual-use technologies are protected by a tall brick wall, impeding transfer of all but the very unsophisticated technologies (hence, requiring a longer list of products) to the Eastern Bloc. This case is further complicated by the multiplicity of gatekeepers for the U.S. brick fence, a triumvirate of authorities, i.e., Department of Commerce, Department of Defense and Department of State. These departments then, are charged with balancing industrial competitiveness, national security, and foreign policy, respectively, within the framework of the export control system. However, philosophical and policy differences are often addressed time and again, on individual license applications, to the frustration of U.S. and international business. This scenario results in competitive disadvantages to U.S. industry due to the differences in the technologies controlled by the U.S. and other COCOM nations. In addition, the lack of an effective interagency dispute-resolution mechanism then causes the individual license application to languish, resulting in a loss of sales to U.S. firms.

An example of languishing license applications was experienced with the classic silicon wafer saw case,¹ when a New Jersey manufacturer, George S. Kachajian, brought his case before the House Foreign Affairs Committee on October 7, 1985. His company, Silicon Technology Corporation, tried for several years to export these saws. The Pentagon was opposed to granting this license based on national security concerns. At that time, a Swiss competitor allegedly sold similar machines to the Eastern Bloc countries instead. In July 1986, after years of study and interagency review, the DOC issued a certificate of foreign availability. However, the license languished, due to problems with COCOM countries. Finally, decontrol occurred early in 1987, over six years after the first license application denial.

D. LEGISLATIVE INITIATIVES

Export controls are addressed by a number of legislative actions introduced at the start of the 100th Congress. These measures include but are not limited to: H.R. 3, H.R. 1141, S. 13, S. 47, and S. 652. H.R. 3, the Omnibus Trade bill entitled, "Trade and International Reform Act of 1987", is the principal initiative at this time. Among the primary export control issues discussed in the bill, as of May 8, 1987, are:

- removal of license obligations for low technology products;
- elimination of the requirement for licenses on exports destined for COCOM countries and subject to COCOM multilateral control;

¹ Rhodes, Lucien, "Kachajian's Rebellion", Inc., October 1986, pp. 92-98.

- authorization of distribution licenses (authorizing multiple exports of goods to approved users) for the Peoples Republic of China;
- elimination of re-export authorization for products shipped from or within COCOM;
- elimination of requirements for re-export licensing of products shipped by free world countries with less than 25% U.S. value;
- imposition of a 30 day time-fence for foreign availability determinations and enhancement of the definition of foreign availability;
- changing the burden of proof of foreign availability, that is the DOC must disprove foreign availability to refuse a license;
- achieve a 40% reduction in the number of list items over the next three years; and
- engage industry representation on the COCOM negotiating delegation.

In short, most of these legislative initiatives aim to reduce the time for licensing and minimize the license burdens by further limiting the items controlled; some items address the interagency balance of power.

E. INITIATIVES OF THE DEPARTMENT OF COMMERCE

On February 9, 1987, the late Malcolm Baldrige, then Secretary of Commerce, delivered a statement on major steps taken by the Department of Commerce to address concerns in export control administration. One month later, the White House released its legislative proposals to the Congress for consideration. In general, these proposals closely track the items discussed in the previous sections, albeit differences do exist in scope and specific definitions. The intent of these proposals, provided in Appendix D, is to reduce licensing burdens. In particular, the February 9 statement declared the Department of Commerce's goal of reducing, "the average license processing time from 20 days to 14 days." Expedited case resolution and automated export licensing system enhancement are also targeted.

III. SUMMARY OF THE ACADEMY REPORT

A. IMPACT OF NATIONAL SECURITY EXPORT CONTROLS

The National Academy of Sciences Panel undertook a significant initiative by seeking to quantify the impact of national security export controls. Their analysis showed that in 1985, the U.S. exported \$62 billion worth of dual-use manufactured goods under license. These goods represented about 40 percent of the total U.S. exports of manufactures in 1985, confirming the quantity of product controlled. Furthermore, not only do these controls apply to a large percentage of U.S. manufactures, but high technology products comprise a majority of the applications.

Table 1 summarizes approved license application data by volume, value, and product category (e.g. electronic computing equipment). Eighty percent of the application volume is encompassed by the electronic computing equipment and electronic assemblies categories. These categories (i.e. the sum of categories 1 and 4) account for 60 percent of the dollar value of all exports.

TABLE 1.¹—APPROVED INDIVIDUAL LICENSE APPLICATIONS FOR MANUFACTURES TO ALL COUNTRIES
IN FISCAL YEAR 1985 ²

[Ranked by dollar value]

Rank	Category	Number of approvals	Dollars in billions	Percent of total value
1.	Electronic computing equipment	42,110	26.1	52.1
2.	Nonmilitary aircraft/helicopters engines	536	7.8	15.6
3.	Nonmilitary aircraft/helicopters and engines/equipment	1,100	3.8	7.6
4.	Electronic assemblies and integrated circuits	12,137	3.6	7.3
5.	Numerical control equipment	513	1.1	2.3
6.	Recording/reproducing equipment	2,205	1.1	2.2
7.	Electronic device manufacturing equipment	2,631	1.0	2.0
8.	Single/multichannel transmission equipment	1,505	.6	1.2
9.	General industrial equipment	3,917	.5	1.0
10.	Compasses/gyroscopes/accelerometers	920	.5	1.0

¹ Source: NAS report, "Balancing the National Interest" . . . , p. 232.

² Table covers top ten categories including 92 percent of total value of all approved individual license applications.

Cumbersome procedures, causing license applications to languish and thwarting congressional intent concerning foreign availability, were identified as the cause of lost sales. Table 2 summarizes the average license processing times by destination and agency. Although the average licensing interval across all destinations is 27 days, cases requiring referral to other agencies, such as the Departments of State and Defense, required 73 days on average.

TABLE 2.—PROFILE OF COMMERCE DEPARTMENT PROCESSING TIMES ¹ FOR INDIVIDUAL LICENSES,
JANUARY 5, 1986–APRIL 5, 1986

[Days]

	Destination countries					All destinations
	All free world	COCOM	Fifteen, Western ^a	Bloc	PRC	
All cases	21	14	36	75	64	27
Nonreferred cases	16	13	24	29	18	16
Referred cases	49	31	57	132	156	73
Other agency processing times:						
State	30	64	18	40	331	31
Defense	6	48	5	31	34	8
Energy	8	3	12	28	71	9
COCOM ^a	0	0	0	114	66	68
CIA	41	41	0	40	59	44
SubGroup on Nuclear Export Coordination	126	0	106	0	0	126
Other	0	7	6	41	63	16
All agency average ^a	9	7	6	41	63	16

¹ Average number of days from recorded entry into the system through license issuance.

^a Non-COCOM countries subject to the Presidential directive authorizing Defense Department review of certain applications because of perceived diversion risk.

^b Differs from all case average since these are incremental agency processing times.

Source: NAS report, "Balancing the National Interest" . . . , p. 236.

Furthermore, the NAS report notes that while 74 percent of the cases are completed in less than 25 days, approximately 5 percent extend beyond 100 days. Processing times vary in ways consistent with U.S. government assessments of diversion risks. These figures, however, include only government processing times, and do not incorporate intervals required to send applications to and receive ap-

provals from the government. These intervals can be significant, sometimes as great as a week in each direction. Also noted, was the observation that in some cases, small firms experience longer intervals than large firms. For example, in West-West trade, the small firm average is 46 days as opposed to 35 days for large companies. From a competitive point of view, these processing times are sharply contrasted by the perception that foreign countries control fewer items and respond more quickly (several days).

Recognizing the potential of lost sales due to lengthy and uncertain licensing intervals, the National Academy of Sciences' Panel conducted a survey of 170 companies which showed the following:² 52 percent reported lost world-wide sales due to export controls; 26 percent lost free world business deals due to export controls; and 38 percent had customers express a preference for non-U.S. supply sources due to export controls.

The Academy Panel also conducted a foreign fact-finding mission from which they observed the attitudes of representatives of foreign governments and businesses toward the U.S. export control system. In general, U.S. export control practices were found to impact negatively on allied relations. Specifically, requirements for reexport authorization among COCOM countries were thought to be onerous.

The Department of Defense was identified by the NAS Panel as introducing an imbalance into the export administration process, ascribing greater criticality to certain technologies than our COCOM partners and thwarting the congressional intent of making U.S. products available when equivalent products are available from foreign sources.

Finally, the Academy panel commissioned a study to ascertain the impact of export controls on U.S. economic vitality. The panel noted that the estimated costs of national security export controls were approximately \$9 billion annually and the loss of 188,000 jobs. Table 3 summarizes the cost breakdown.³ The methodology used to derive these estimates calculates the difference in lost sales, (West-West and West-East), reduced R&D spending, the actual value of licenses denied, and the lost profits on foreign affiliate sales between the current control regime and a situation in which all COCOM countries administered the same control system.

TABLE 3.—COMPONENTS OF ECONOMIC IMPACT ON THE UNITED STATES OF NATIONAL SECURITY EXPORT CONTROLS, 1985

[In billions of dollars]	
Components:	Loss
Lost West-West export sales.....	5.9
Lost West-East export sales.....	1.4
Administrative cost to firms	.5
Reduced research and development spending	.5
Value of licenses denied.....	.5
Loss profits on foreign affiliate sales.....	.5
Total	9.3

Source: NAS report, "Balancing the National Interest . . .," p. 266.

² "Balancing the National Interest," National Academy Press, Wash., D.C., 1986, p. 116.

³ Ibid. p. 121.

It should be noted, however, that the Academy report states, "It is important to emphasize that the panel did not base its findings or recommendations on these estimates of direct economic costs of national security export controls."⁴

B. ACADEMY REPORT RECOMMENDATIONS

Appendix C of this report provides a summary of the NAS Panels' recommendations. These recommendations number 17 in total, distributed across two major themes: (1) Strengthen the COCOM mechanism and (2) accord greater importance in U.S. national security export control decisions to maintaining U.S. technological strength, economic vitality and allied unity.

The recommendations for strengthening the COCOM mechanism are:⁵

1. Control only COCOM-proscribed items.
2. Within COCOM, seek controls on exports to third Countries.
3. Negotiate comprehensive understandings with third Countries.
4. Remove items whose control is no longer feasible.
5. Maintain unilateral control (controlled only by the U.S. as opposed to COCOM nations or other multinational arrangements) only on a temporary basis or for limited, unique national security circumstances.
6. Eliminate reexport authorization requirements in countries participating in a community of common export controls on dual use technology.*
7. Maintain current control procedures on the transfer within COCOM of sensitive information, technical data, and know-how.
8. Reduce the scope of the COCOM list and modify COCOM decision-making policies and procedures.
9. Maintain a clear separation between national security and foreign policy export control.

Recommendations covering the balance between national security, economic vitality, and Allied unity concerns are:

1. Balance the protection of military security with the promotion of national economic vitality through affirmative policy direction.
2. Provide sufficient resources and authority to the Department of Commerce and State to allow them to fulfill their roles in the export control process.

⁴ Ibid. p. 122.

⁵ Ibid. pp. 169-177.

* For example, under present procedures, businesses in COCOM nations must seek U.S. authorization for the shipment of products to COCOM member nations if these products are of U.S. origin.

3. Restore technical judgement and overall balance to the national security export licensing process.

4. Implement the decontrol procedures required by law when foreign availability is found to exist.

5. Withdraw the statutory requirement to integrate the Military Critical Technologies List (MCTL) into the Commerce Department's control list.

6. Provide effective, two way communication at the highest level between government and the private sector.

7. Develop reliable data regarding the operation and impact of U.S. national security export controls.

8. Make more systematic use of intelligence evidence on current and anticipated Soviet acquisition efforts.

IV. IMPACT ANALYSIS IN THE ACADEMY REPORT

Based on its study of the National Academy of Sciences report on the Impact of National Security Controls on International Technology Transfer and the testimony presented at our hearings, the following comments are made:

A. A CRITIQUE OF THE DATA ANALYSIS IN THE ACADEMY REPORT

The National Academy of Sciences has made a landable attempt to quantify the impacts of national security export controls. Clearly, as pointed out by the Academy Panel, a balance must be achieved between the economic costs and the economic benefits of controls, in concert with consideration for U.S. military strategy. U.S. policy on export controls must strive to maintain this balance, minimizing the economic and competitive costs to U.S. industries. The Academy Panel's survey presents significant evidence of industry's perception of U.S. export control policy, as placing these companies at a competitive disadvantage.

1. *The quantification of economic costs*

In addition to the qualitative evidence of the survey results, a quantitative analysis was presented. This analysis on the economic impact of controls, prepared for the NAS Panel by Quick, Finan and Associates, asserts that "A reasonable estimate of the direct, short-run economic costs to the U.S. economy associated with U.S. export controls was on the order of \$9.3 billion in 1985." In addition, the NAS report states that,⁶ "Associated just with lost U.S. exports was a reduction in U.S. employment of 188,000 jobs."

This assessment (including economic costs and lost jobs) was generated by first identifying a specific set of products which encountered regulatory changes in the export control system. Increases and decreases in sales activity, resulting from these regulation changes were identified. This quantification of cause and effect was then extended to all manufactures and aggregated in a value of lost sales. Finally, estimates of 1985 lost sales were converted to lost jobs.

Following the early release of the Academy report results, the Committee observed that perhaps the aspect of the NAS study

⁶ Ibid. p. 264.

most widely-quoted by the news-media became the estimates of lost U.S. sales and employment. For this reason, we closely examined the data utilized in the NAS study as well as the underlying assumptions upon which the estimates in the NAS report were based. After studying the analysis in the NAS report, the Committee staff developed its own assessment, resulting in job loss estimates only 15% to 20% of the 188,000 presented in the Academy report. Appendix E presents a summary of the salient differences between the estimates in the Academy's report and those of the staff. Although the Committee's estimates of lost employment are certainly appreciable, they suggest that the contribution of national security export controls to U.S. competitive decline may be overshadowed by other factors such as unfair trade practices (e.g. semiconductor dumping), non-tariff trade barriers, and monetary exchange rates. On the other hand, national security export controls may be most detrimental to certain products, companies, and industries involved with emerging technologies, where export controls and other non-tariff trade barriers can impede the necessary business growth rates.

2. Benefits of national security export controls

In addition to the disparities in the aforementioned quantitative estimates of direct economic costs, the NAS report did not show quantitatively that the direct economic costs exceeded the benefits. The NAS report did discuss the benefits of national security export controls, as found in a DOD study, as a savings of \$1 billion per year for U.S. defense spending and similar Soviet savings.

These estimates were predicated primarily on increased Soviet production efficiencies resulting from the acquisition of western technology and the assumption that Soviet spending changes would induce corresponding U.S. responses.

The NAS report questioned the validity of the more widely quoted assertion by the DOD that "the costs of the Soviet long term acquisition program are much higher—perhaps \$20 to \$50 billion per year".⁷ These latter estimates account for U.S. responses to the improvement of Soviet weapons systems,⁸ for which the Academy report does not account.

In short, the NAS report draws no conclusions about the financial benefit of export controls. However the discussion in the NAS report would place the value between \$1 billion and \$50 billion per year. These estimates easily bracket the \$9 billion loss estimate.

3. Summary of the quantitative analysis

Although the anecdotal evidence of the impact of export controls is significant, the economic costs reported by the National Academy differ from Committee staff estimates of employment loss by over a factor of five. It is not clear that the quantitative analysis presented in the Academy report accurately represents the perceived impacts to U.S. manufacturers, relative to foreign competitors under COCOM control. A quantification of the impact of a

⁷ Ibid. p. 110.

⁸ See "Assessing the Effect of Technology Transfer on US/Western Security", Office of the Undersecretary of Defense, February 1985, pp. e-5 and e-6.

technology loss was not attempted in the NAS report, i.e., if technology were free to flow uncontrolled, what would be the costs to our military and non-military R&D enterprise? Furthermore, an accurate or reasonable cost-benefit analysis may not be practical.

B. INTERNATIONAL COOPERATION AND MULTILATERAL CONTROLS

The central debate on national security export controls should focus on the enhancement of cooperative multinational control mechanisms.

Ways to enhance the effectiveness of existing mechanisms and achieve greater multilateral uniformity in the implementation of the export control regulations are an essential concern.

At the April 23 hearing, Chairman Roe stated, "... an international cooperation among our allies, *that* seems to be the heart of the issue." Recognizing the growing technological advance and industrialization of many nations, e.g., the Pacific Rim countries, only a coordinated international approach to national security export controls is realistic. Free world objectives can only be met through international cooperation.

Existing mechanisms such as the Coordinating Committee (COCOM) on Multilateral Export Controls and/or other bilateral or third country agreements must be enhanced. Uniformity through cooperation should be sought in the areas of: physical control and penalties; identification of critical technologies and thresholds; and interpretation of parameters of critical technologies. Furthermore, international scientific cooperation among these free world nations must be encouraged to advance our common technological base.

There is wide agreement that only strategically important technologies should be controlled. Unilateral controls should be used sparingly and for short durations, where unique national security risks exist. Use of long-term unilateral control can significantly disadvantage U.S. manufacturers. Reductions of the list of controlled items should be sought where either an item no longer has a strategic importance or the potential for achieving a uniform international treatment of that technology is unlikely. Additionally, list reductions should be accomplished by technical review.

C. U.S. EXPORT CONTROL ADMINISTRATION

The Executive branch should place a high priority on achieving a uniformly implemented multinational export control system. The Executive branch should continue to pursue initiatives which streamline the administration of export controls by the Department of Commerce, State and Defense. Again, only strategically important technologies should be controlled. License application review intervals should be minimized. The Commerce Department has already evidenced movement toward these ends. Control list reductions, automation enhancements and improving the resolution of interagency disputes will minimize the impact of licensing requirements to U.S. industry.

Testimony of the National Academy of Sciences Panel and Secretary Perle both confirmed the deficiency within the Commerce Department in technical personnel and automated data and information handling. A written follow-up by Dr. Paul Freedenberg, As-

sistant Secretary of Commerce for Trade Administration, identified automation improvements currently underway at the DOC.

However, the Commerce Department still appears to suffer from a lack of expert personnel for technical evaluation of product specifications.

Responding to a question about the technical expertise of government personnel from Congressman Hayes, Dr. Allen stated,

Sir, I think the point you make is a very serious one. Obviously you are aware that it applies not only to equipment, we are also aware that it applies in the more sophisticated, really very high tech items that are at issue here today.

The Government finds it very difficult to keep on its staff, particularly in Commerce, the appropriate technical expertise to judge these licenses, and I think it is a matter that needs to be considered carefully to improve their ability to obtain the appropriate people and to retain them in these jobs. They do not have the up-to-date engineering expertise that is necessary.

The retention of high quality technical personnel within the Department of Commerce for product specification analysis is essential.

The DOC currently employs 53 engineering professionals for license applications review, with the Department processing over 116,000 applications in 1986. This equates to roughly 2,200 applications per technical staff member. The equivalent staff workload within the DOD is roughly 1,400 applications per technical staff member (28,000 applications with 20 technical staff). Although many licenses may not require technical review, this imbalance supports the calls heard in the hearings for an enhancement of the quality and quantity of technical resources at the DOC for these purposes.

D. RESTRICTIONS ON TECHNICAL DATA EXCHANGE

This Committee has long been concerned with the impact of national security export controls on scientific communications. At a May 24, 1984 joint hearing of the Subcommittee on Science, Research and Technology and the Subcommittee on Investigations and Oversight, Congressman Doug Walgren stated, "we are keenly interested in how such restrictions will affect the vigor and vitality of the open environment necessary for progress in science and technology."⁹ Findings of the 1982 NAS Panel on Scientific Communication and National Security observed, "that a national strategy of security by secrecy would weaken American technological capabilities, because there is no way to restrict international scientific communication without also disrupting domestic communications."¹⁰

The National Academy of Sciences' report states that "Controls on unclassified DOD technical data have a chilling effect on the

⁹ "Scientific Communications and National Security," Committee on Science, Space, and Technology, May 24, 1984 p. 1.

¹⁰ Ibid. p. 5.

U.S. R&D community and should be imposed sparingly". Although some proposed revisions to the Export Administration Regulations may "limit the impact of expanded validated license requirements on foreign national employees of U.S. firms, industry-university cooperation could be reduced." Broad expansion of the Military Critical Technologies List (MCTL) to prioritized "arrays of know-how", covering information systems, computers, software, etc., could limit the potential contributions of the university research community to the advancement of commercial technology.^{11, 12}

Further review, of any planned changes to the Export Administration Regulations regarding controls on unclassified technical data, is therefore warranted.

E. INTERNATIONAL SCIENTIFIC COOPERATION

U.S. policy must encourage international cooperation in scientific areas in order to (1) achieve necessary rapid technological advance and (2) respond to the increased scope of many science initiatives which require financial resources and technical talent that exceeds the capacity of any single company, university, or country. The dilemma is that restrictions on technical communication and cooperation for the purpose of national security may conflict with desires to pursue international cooperation. Clear U.S. policy articulation is necessary before major cooperative arrangements are negotiated. The need for a lead agency with a mandate for clear and broad policy interpretation of international scientific cooperation was indicated by the April 23 dialogue between Congressman Hall and Assistant Secretary of Defense, Richard Perle:

Mr. HALL. How is the Administration coordinating its policy towards projects to ensure the cooperation of all the agencies?

Mr. PERLE. I think on the broad policy issues we have not coordinated nearly as well as we should, to be frank about it. I think one of the reasons for that is that each of these cooperative programs involves some department of the Government whose principal mission is to do something else, and then they get off into this diplomatic area and they may not be sufficiently conscious of all the considerations that should apply.

So this is an area that requires interagency coordination.

Mr. HALL. Is there a lead agency? I think you have already set out that if two are in disagreement, that perhaps the National Security Council, or even up to the President would reconcile it.

Mr. PERLE. If the subject matter includes the word "international" then the Department of State considers that it is the lead agency. The agencies that are often most important in the process are the ones that are going to manage the program if the program is agreed to. So obvi-

¹¹ Gould, Stephen B. "Balancing the National Interest: Working Paper"; National Academy Press, 1987, pp. 18, 19.

¹² Office of the Secretary of Defense, "Military Critical Technologies Program", July 17, 1986, p. 121.

ously on something like space cooperation, NASA is terribly important.

Mr. HALL. If we are going to have any kind of interagency feuds, or differences, it is important that these not erupt after prospective foreign partners that we have enticed into spending some of their money, after they have invested significantly.

Mr. PERLE. Well, one way to handle it would be to establish a pretty clear and a pretty broad policy in advance so that you don't have a department discovering six months into negotiation, that a negotiation they did not know existed was in fact that far advanced. That has been known to happen from time to time.

We are a large Government with a lot of departments and with many of them involved in international cooperative programs, and sometimes things go wrong. But we could improve and should improve the interagency coordination on these kinds of issues, because they are difficult issues.

Big science initiatives such as the Superconducting Super Collider and the Space Station clearly provide numerous opportunities for international assistance. In addition, proposals such as SEMATECH, which currently preclude foreign participation, have been criticized for these restrictions. Critics maintain that there exists a global technological enterprise which should encourage free exchange, absent controls. It should be noted, however, that the SEMATECH restrictions are predicated, in part, on the need for the U.S. to develop and maintain a competitive commercial technological comparative advantage. A similarity then exists in that the SEMATECH restrictions and national security motivations both reflect the perceived need for the U.S. to maintain a technological advantage.

These realities, then, may conflict with the pursuit of international scientific cooperation, and the concept of a global technical enterprise. The Committee finds that the limitations of these latter concepts must be developed into a broad policy on the conduct of international scientific cooperation.

V. CONCLUSIONS

The report of the National Academy of Sciences Panel presents significant evidence of industry's perception of a competitive disadvantage caused by U.S. national security export controls. The Academy is to be commended for its attempt to quantify the impact of these controls. However, the analysis, for reasons presented earlier in this report, may have overstated the competitive impacts. Furthermore, the Academy report does not demonstrate quantitatively that the economic costs exceed the economic benefits. On the other hand, many of the thoughtful administrative recommendations in the Academy report are meritorious and closely correspond to legislative initiatives of H.R. 3 and internal measures already implemented at the Department of Commerce.

Given the Executive and Legislative Branch initiatives already underway and aimed at streamlining the licensing process, the

Committee finds that the central issue in the debate on national security export controls is the enhancement of our cooperative multinational control mechanisms. U.S. policy should place a priority on further strengthening of this mechanism and achieving uniformity in the areas of: physical control and penalties; identification of critical technologies and thresholds; and the interpretation of parameters of critical technologies. Furthermore, only strategically critical technologies should be controlled.

Further action and review by the Committee appears to be required in the following areas:

A. INTERNATIONAL SCIENTIFIC COOPERATION

International scientific cooperation is an essential ingredient to the steady scientific and technological advance of Free World nations. Big Science initiatives, such as the Space Station and the Superconducting Super Collider provide opportunities for needed technical exchange. National security restrictions on foreign participation in consortia such as SEMATECH, threaten the existence of a clear policy articulation. Questions that arise include: Are we developing a policy which endorses restrictions on technology for both military and commercial comparative advantage, while having a less restrictive view on pure science?; and, How does this policy differentiate between science and technology?

At this time, no broad policy or designated lead government agencies have been lucidly identified for defining and facilitating this cooperation. Therefore, the Committee may find it desirable to hold hearings on the necessary framework from which our government can develop a consistent policy on technical communications and enter into international scientific cooperative agreements.

B. ENHANCED TECHNICAL SUPPORT FOR THE EXPORT CONTROL SYSTEM

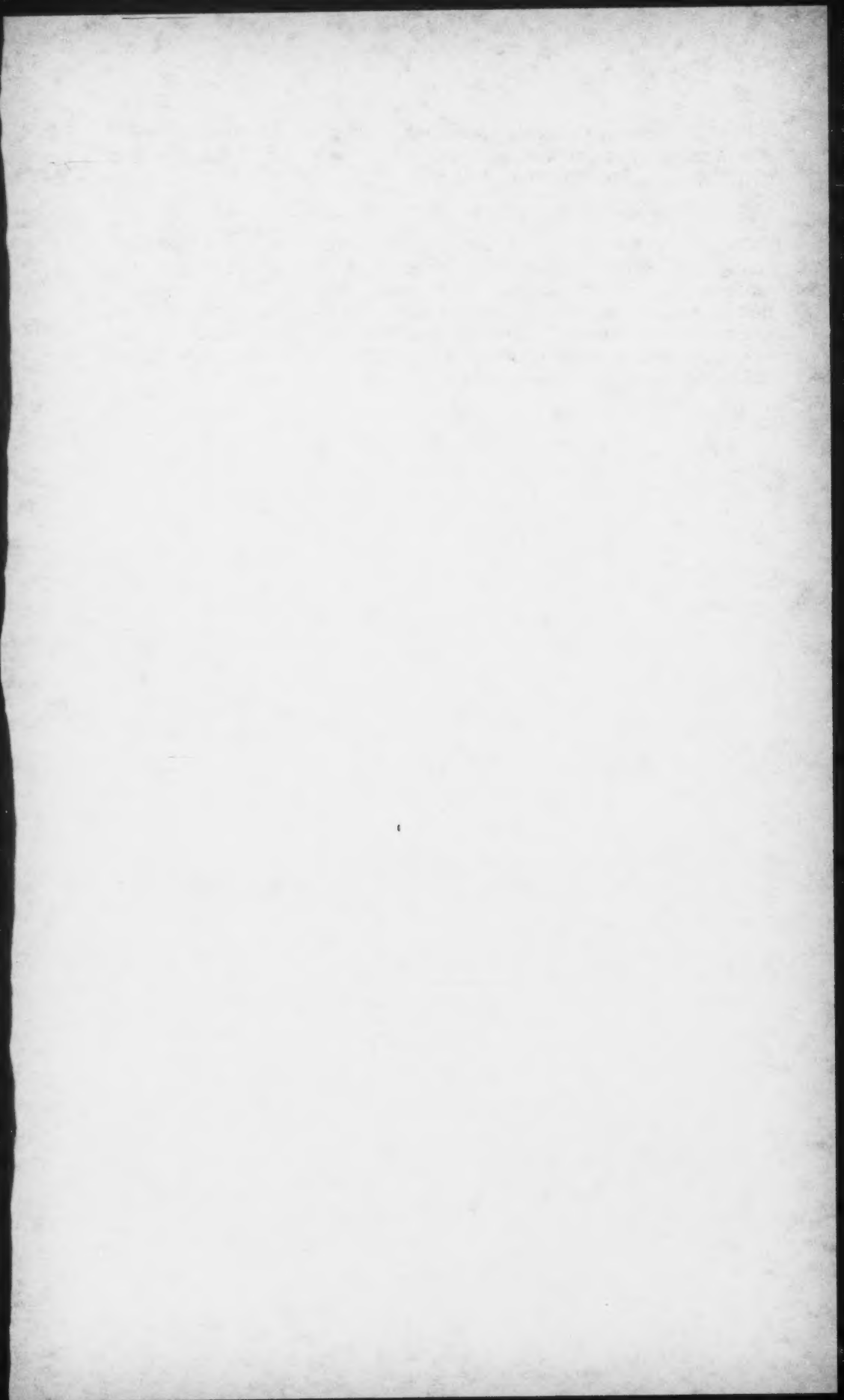
Testimony of the National Academy of Sciences' Panel and Secretary Perle both confirmed the lack within the Commerce Department in technical personnel and automation. A written follow-up by Dr. Paul Freedenberg, Assistant Secretary of Commerce for Trade Administration, identified automation improvements currently underway at the DOC. However, the Commerce Department still appears to suffer from a lack of expert personnel.

A potential solution to this problem is an expanded role for the National Bureau of Standards. One proposal would be to locate all DOC technical personnel, currently involved in export license review, under NBS. In addition, NBS would function as the lead technical organization for license review, drawing upon other agencies such as the DOD, as appropriate. This proposal builds upon the Bureau's already close ties with industry and its knowledge in high technology manufacturing and voice/data communications. Another advantage to assigning this role to the Bureau is that it is well respected by the technical community (domestically and internationally) which may help in attracting talented engineers for the review and interpretation of technical parameters. Finally, the situation of NBS within the DOC reinforces the Department of Commerce's lead role in the license review system.

Further hearings on this and other proposals to enhance the Department of Commerce's technical talent for export license review may therefore be desirable.

C. RESTRICTIONS ON TECHNICAL DATA EXCHANGE

Concern over the intent and enforcement of technical data exchange, as defined in the DOD Directive 5230.25 and the 1984 Defense Authorization Act has been raised. Restrictions on unclassified technical communications threaten the necessary pace of rapid scientific advance and spirit of international cooperation. It may therefore be desirable to assess the extent of restrictions on unclassified technical communications.



APPENDIX A: PRINCIPAL NAS REPORT FINDINGS

FINDINGS AND KEY JUDGMENTS OF THE PANEL

Based on the research initiatives and deliberations undertaken in pursuit of its charge, the panel reached unanimous agreement on a series of principal findings and key judgments listed below.

I. THE PRACTICAL BASIS FOR NATIONAL SECURITY EXPORT CONTROLS

The fundamental objective of the national security export control regime maintained by COCOM is to deny—or at least to delay—the Soviet Union and its Warsaw Pact allies access to state-of-the-art Western technology that would permit them to narrow the existing gap in military systems. Yet, there are no well-defined criteria that can be used to determine whether a given technology will enhance significantly Soviet military capability. Moreover, the precise definition and implementation of such criteria will depend to a large extent on the world view of the decision maker. For an export control system to be operationally effective, however, such distinctions must be drawn. This difficulty can be surmounted in practice by establishing a definition that permits effective, practical implementation of controls with our allies, which means restricting controls to technologies that are easily identified with military uses.

II. CONSIDERATIONS INFLUENCING NATIONAL POLICY

1. Technology lead is vital to Western security and must be maintained

Western security depends on the maintenance of technology lead over potential adversaries. This lead can only be sustained through a dual policy of promoting a vigorous domestic technological base and impeding the outward flow of technologies useful to the Warsaw Pact in military systems.

2. Export competitiveness is essential to the health of the U.S. domestic economy

In some industrial sectors, especially high-technology enterprises, firms now must remain competitive in the world market to maintain a share of the U.S. domestic market, due to necessary economies of scale and the increased importance of R&D from foreign sources. The new realities of global competition are not yet fully reflected in the policies underlying current U.S. national security export controls.

3. The scope of current U.S. national security export controls undermines their effectiveness

U.S. national security export controls are not generally perceived as rational, credible, and predictable by many of the nations and commercial interests whose active cooperation required for an effective system. In their view the scope of current U.S. controls encompasses too many products and technologies to be administratively feasible. The panel concurs with this judgment.

4. U.S. national security export controls impede the export sales of U.S. companies

There is limited but specific evidence that export sales have been lost or foregone because of uncertainty or delays in the licensing process and because of concern about future license approvals, availability of spare parts and components, and possible reexport constraints. Once changes in buying preferences occur, they may require large investments of time and effort to reverse.

5. Pragmatic control lists must be technically sound, narrowly focused, and coordinate multilaterally

Although the control criteria developed in 1976 as part of the report of the Defense Science Board task force (*An Analysis of Export Control of U.S. technology—A DoD Perspective*), also known as the Bucy report, are theoretically sound, they have not always proven useful to the implementation of national security export controls. The preparation of control lists must be dynamic process that is both informed by advice from technical advisory groups and constrained by the need to be clear, to

focus control efforts more narrowly on fewer items, and to coordinate U.S. action more closely with that of our COCOM allies.

6. The extraterritorial aspects of U.S. controls engender mistrust and weaken allied unity

Several elements of U.S. national security export controls, especially the requirement for reexport authorization, are having an increasingly corrosive effect on relations with many NATO countries and on other close bilateral relationships. They signal U.S. mistrust of the will and capacity of allies to control the flow of sensitive technology to the Soviet bloc.

III. SOVIET TECHNOLOGY ACQUISITION EFFORTS IN THE WEST

1. Available evidence on Soviet technology acquisition efforts reinforces the need for effective multilateral export controls

The panel has reviewed a substantial body of evidence—both classified and unclassified—that reveals a large and aggressive Soviet effort to target and acquire Western dual use technology through espionage, diversions, and to a lesser degree legitimate trade. There is limited but specific evidence both on the means by which Soviet acquisitions are accomplished and on their important role in upgrading or modernizing Soviet military systems. Although internationally coordinated efforts are necessary to counter the use of diversions or legitimate trade for such purposes, export controls are not a means for controlling espionage, which alone accounts for a high proportion of successful Soviet acquisition activities.

2. Despite systemic difficulties, Soviet technical capabilities have successfully supported the military objectives of the USSR

Because the Soviet system does not enjoy the benefits of a robust commercial sector, it is at a fundamental disadvantage in terms of the promotion of technological innovation. Nevertheless, the Soviets have demonstrated an effective technical capability to meet their military objectives.

IV. DIFFUSION AND TRANSFER OF TECHNICAL CAPABILITY

1. Wide global diffusion of advanced technology necessitates a fully multilateral approach to controls

Because advanced technology has now diffused so widely, national security export controls cannot succeed without the following: (1) an effective COCOM process by which the other major COCOM countries accept responsibility for regulating exports and reexports from their territory of COCOM-controlled technology to non-COCOM Free World countries; and (2) the adoption by the more advanced newly industrializing countries of COCOM-like standards for their own indigenous technology.

2. Controls on the employment of foreign nationals in the U.S. R&D infrastructure must be used selectively and sparingly

Foreign nationals now play a significant role in U.S. domestic R&D activities as well as in the laboratories of U.S. foreign subsidiaries. Such individuals contribute significantly to U.S. technological innovation and hence promote the national interest. Sparing use should therefore be made of existing legislative authority to restrict technical exchanges or to limit full participation of foreign citizens in the U.S. R&D community. It is particularly important to distinguish, as appropriate, between citizens of nations to whom exports are proscribed and citizens of all other nations.

V. FOREIGN AVAILABILITY AND FOREIGN CONTROL OF TECHNOLOGY

1. The congressional mandate for decontrol of items based on foreign availability is not being fulfilled

The lack of action on foreign availability is inconsistent with the intent of Congress as expressed most recently in the Export Administration Amendments Act of 1985. In those cases in which there is foreign availability of U.S.-controlled items, U.S. industry is unfairly placed at a competitive disadvantage with respect to firms from other countries that are not similarly constrained. This disadvantage can lead to the erosion of competitive market advantages previously enjoyed by U.S. industry and in some cases to the permanent loss of U.S. markets.

2. Control of "technological commodities" is impractical

The control of goods for which the volume of manufacture is so large and the scope of marketing and usage so wide that they have become "technological com-

modities" (e.g., some classes of personal computers or memory chips) is not practical. Decontrol of such goods to all Free World destinations is, in some cases, the only appropriate solution.

3. Bilateral agreements with Free World non-COCOM countries must protect all COCOM-origin technology and must control similar indigenously produced goods

Over the short term, bilateral agreements that restrict only the reexport of U.S.-origin technology unfairly disadvantage U.S. companies in international trade. Over the long term, these agreements with non-COCOM countries will not promote the effectiveness of the COCOM export control system unless they restrict the reexport of technology from all COCOM sources as well as technology produced indigenously.

4. Other COCOM countries must be more vigilant in preventing diversions of both COCOM-origin and indigenously produced technology

Some members of COCOM could substantially improve their efforts to prevent diversions of COCOM-origin products and technology being exported to third countries. Since compliance with U.S. reexport controls is not likely to become politically acceptable in most COCOM countries, some compromise solution must be reached.

5. The extraterritorial reach of U.S. controls damages allied relations and disadvantages U.S. exporters

The extraterritorial reach of U.S. reexport controls is anathema to most U.S. trading partners. Moreover, many foreign governments do not agree that the United States has jurisdiction over the actions of their citizens outside U.S. territory. The extraterritorial extension of U.S. controls is viewed by these governments as a direct challenge to national sovereignty and a clear violation of international law. It is seen as additional evidence of mistrust by the United States of the capacity of these governments to further the West's common interest in preventing the diversion of militarily important goods and technologies.

VI. EFFECTIVENESS OF THE MULTILATERAL PROCESS

1. The United States must clearly distinguish foreign policy export controls from national security export controls

There is much less consensus among the COCOM allies on the use of trade restrictions for foreign policy reasons than on controls in the interests of national security. Thus, to the extent that the United States fails to distinguish clearly between the two, allied cooperation in support of consensual national security objectives is undermined.

2. The impact of controls on advantageous scientific communications and transfer within the Western alliance must be minimized

Because open scientific communication and trade within the West are as important to maintaining Western technology lead as is controlling the flow of technology to the Soviet bloc, U.S. policy should lend equal emphasis to both objectives.

3. The COCOM countries should take specific steps to bolster the efficiency and effectiveness of multilateral controls

Among the most important issues now facing COCOM are: (a) reduction in the overall scope of the list, (b) modification of the procedures for decontrolling items from the International List of dual use items, and (c) provision of greater transparency in COCOM decision making.

4. The COCOM process would benefit if all country delegations had balanced economic and defense representation

The U.S. delegation to COCOM, unlike those of other member nations, includes a significant contingent of defense officials. A balance of economic and defense representation on all COCOM delegations would enhance COCOM unity and the usefulness of the COCOM process, in part by helping to resolve conflicts between competing economic and military objectives.

5. Foreign perceptions of U.S. commercial advantage derived from export controls impeded multilateral cooperation

There is a widely held view in Europe and the Far East that the United States use its national security export controls to afford commercial advantage to U.S. companies. Although the panel found no substantive evidence to support this view the existence of these perceptions makes it difficult to gain effective multilateral cooperation.

6. Unilateral controls are of limited efficacy and may undermine allied cooperation

The imposition by the United States of unilateral national security export controls for dual use items can be justified only as stopgap measure pending negotiations for the imposition of multilateral controls or in rare cases in which critical national security concerns are at stake requiring unilateral restrictions. It must be recognized that, except when used as a temporary measure, the application of unilateral controls undermines the incentive of the allies to develop a sound basis for multilateral restriction.

VII. ADMINISTRATION OF U.S. NATIONAL SECURITY EXPORT CONTROL POLICIES AND PROCEDURES

1. The lack of high-level oversight and direction degrades the effectiveness of U.S. controls

The administrative structures established by the executive branch have not proven effective in resolving the frequent policy differences among the three principal line agencies (the Departments of State, Defense, and Commerce). The White House has intervened only intermittently and then primarily to contain interagency conflict rather than to provide adequate policy direction. The lack of higher-level oversight and direction results in duplication of effort, uncertain lines of authority, serious delays in decision making, and underutilization of information-sharing capacity.

2. Unequal effort by and resources of the three principal line agencies have led to conflict, confusion, and unbalanced policy

DoD's determined efforts to reinvigorate the national security export control regime have been useful in raising the general level of awareness in the United States and in other COCOM countries. But this increasingly active DoD role also has led to an imbalance in the distribution of government effort and resources. Although DoD has created a new dedicated agency for technology security, neither the Department of Commerce nor the Department of State has been able to implement equally effective measures. The result is a lack of balance in the interagency policy formulation process and an inefficient licensing process.

3. Shifts in responsibility within the line agencies may preclude broadly informed and balanced policy judgments

Reorganization initiatives in a number of the principal line agencies tasked with managing export controls have resulted in a shift of responsibility away from organizations with expertise in technology development and international trade and toward those whose principal and often only concern is technology control. Although there have been positive effects of this shift in responsibility, there has been a loss of sustained technical input into the policy process for national security export controls.

4. Current licensing requirements, classification procedures, and proprietary controls for technical data are both appropriate and adequate

Although technical data that are not publicly available require a validated license for export to the Soviet bloc, data exports to other destinations for the most part are eligible for a general license. The need for the unhindered exchange of large volumes of data in international commerce and research indicates that a strict system of control is neither feasible nor desirable. Existing licensing requirements, classification procedures, and proprietary controls offer sufficient protection.

5. Controls on unclassified DoD technical data have a chilling effect on the U.S. R&D community and should be imposed sparingly

The Department of Defense Authorization Act (DAA) of 1984 permits DoD to impose restrictions on domestic dissemination or export of DoD-funded or DoD-generated technical data whose export would otherwise require a validated license under EAR or ITAR. Such restrictions have the effect of creating de facto a new category of unclassified but restricted information. These new, more comprehensive technical data restrictions have had a chilling effect on some professional scientific and engineering societies that have elected voluntarily to close certain sessions. It is the panel's judgment that imposing controls on technical data that are broader than those now in effect is not warranted by the demonstrable national security benefits.

6. The congressional mandate for integrating the Militarily Critical Technologies List (MCTL) into the Commerce Department Control List practically cannot be accomplished

The MCTL has been used inappropriately as a control list, and its annual revision has resulted in a voluminous itemization of many important technologies without apparent prioritization. Because the Department of Defense and Commerce maintain fundamentally different objectives in their list development exercises, the congressionally mandated task of integrating the MCTL into the Commerce Department's control list practically cannot be accomplished.

7. The complexity of U.S. export controls discourages compliance

The complexity of U.S. export controls discourages compliance, especially by foreign firms and small- to medium-size U.S. companies. For example, the Export Administration Regulations constitutes nearly 600 pages of rules and procedures. These could be reduced and simplified substantially—and made more “user friendly.”

8. There is a need for high-level industry input in the formulation of national security export control policy

There is a need for an effective mechanism within the government to provide meaningful input from the private sector on the formulation of a coordinated national security export control policy. Such a group must be constituted at sufficiently high corporate levels to reflect major industry concerns, and it must be able to have an impact on the actual policy process.

9. Voluntary cooperation from industry is important to the enforcement of export controls

Voluntary cooperation by U.S. industry—particularly companies with overseas subsidiaries—is important to export control enforcement, especially in the identification of violations. Companies frequently have knowledge otherwise unavailable to the government of possible violations by other firms.

10. Adequate information to evaluate the impact of national security export controls is not maintained by the U.S. government

This study has revealed serious shortcomings in both the quality and quantity of information maintained and analyzed by the U.S. government on the coverage, operation, and domestic and global impacts of national security export controls. In the absence of better information, it will continue to be difficult for policymakers to arrive at more informed and balanced judgments as to the advisability of controls.

11. A comprehensive cost/benefit analysis of controls currently is infeasible

Despite some preliminary efforts to assess the competitive effects of national security export controls, a comprehensive empirical analysis of the costs and benefits is precluded by the lack of data, by the complexity of the system, and by a variety of qualitative judgments that must enter into any evaluation.

There is little doubt that, without the heightened attention to these issues initiated in the early years of the current administration by DoD, the problem of Western technology diversion to the Soviet Union would by now be considerably worse. But the panel is concerned that this policy “correction”—useful and necessary as it was—should not now overshoot the mark. The panel wishes to reiterate therefore its concern about the continuing lack of balance within the policy process for national security export controls regarding the representation of technical, national security, economic, and domestic and international political interests. This balance should be developed and maintained within each agency, among agencies of the U.S. government, and among countries participating in COCOM.

APPENDIX B: BACKGROUND ON COCOM

BACKGROUND INFORMATION ON COCOM *

COCOM was initially conceived in postwar discussions between the United States, Britain and France. By 1948, the U.S. Government had begun to enlist the cooperation of its West European allies for an embargo policy against the communist bloc. All of these discussions were handled informally and in secrecy. The organizational framework was completed in 1949. It is doubtful whether any written understanding ever existed. COCOM began operations on January 1, 1950 with a membership consisting of the United States, England, France, Italy, the Netherlands, Belgium, and Luxemborg. Additional members who joined between 1950 and 1953 included; Norway, Denmark, Canada, West Germany, Portugal, Japan, Greece and Turkey.

A permanent secretariat is located in Paris where participating countries retain permanent delegations. The U.S. delegate and his deputy are State Department officers. Their permanent staff is joined by teams of U.S. based government technical experts and interagency policy level personnel during negotiations. Because it is an informal and voluntary organization, COCOM has no power of enforcement. Its members have no legal obligation to participate or be bound by COCOM recommendations.

Representatives of COCOM engage in three kinds of activities: the development of lists of technologies and products that will be embargoed, controlled or monitored; weekly consultations on exceptions of these lists; and consultation on enforcement.

There are three COCOM lists, organized according to the technical specifications and applications of the items contained on them:

1. a munitions list that includes all military items,
2. an atomic energy list that includes sources of fissionable materials, nuclear reactors, and their components, and
3. an industrial/commercial list.

Most of the activities of COCOM emanate from the last list, which by definition contains dual use items e.g. jet engines, computers. . .

The industrial list is further subdivided into three categories, as follows:

International List I: embargoed items; not sold to communist bloc.

International List II: quantitatively controlled items, exported in specified quantities only.

International List III: exchange of information and surveillance of end-use required by exporting country.

International List I generates the major controversy in scope, policy and discussion of exceptions.

Decisions on exception cases must be unanimous, albeit the final decision in matters before COCOM rests with each individual country. For example, the addition of an item to the control list must be unanimous, however, actual control is left to the individual countries.

The motivation for cooperation is the desire to increase mutual security by adhering to uniform export controls.

For further information, see references (1, 2).

*The Coordinating Committee on Multilateral Export Controls.

¹ OTA Report, Technology and East-West Trade, chapter VIII, 1979.

² Root, William, "COCOM—A Unified System", Congressional Research Conference, April 17, 1987.

APPENDIX C: PRINCIPAL RECOMMENDATIONS OF THE NAS REPORT

PRINCIPAL RECOMMENDATIONS OF THE PANEL

The panel makes two basic recommendations, together with a series of corollary prescriptions.

I. STRENGTHEN THE COCOM MECHANISM

The panel recommends that the United States take the lead in further strengthening the COCOM mechanism so that it can function as the linchpin of a fully multilateral national security export control regime for dual use technologies. Under current and prospective global circumstances, such a multinational system is essential to achieve maximum export control effectiveness without impairing Western economic vitality. To strengthen the current multilateral control regime will require greater harmonization of the current U.S. approach and those of our technologically advanced allies through closer consultation and the adoption of policies that promote cooperation. The two most immediate objectives are: (1) to limit the coverage of the U.S. Control List and the COCOM International List to those items whose acquisition would significantly enhance Soviet bloc military capabilities and that are feasible to control, and (2) to obtain agreement on a common approach to reexports of COCOM-origin items.

The United States should strive to create a community of common controls in dual use technology—that is, a set of trade relationships unimpeded by national security restrictions—among those Free World nations that share an expressed willingness to adhere to common or equivalent export control restraints on the transfer of strategic and controllable goods and technologies to the Soviet Union and its Warsaw Pact allies. Accordingly, the panel recommends the following changes in U.S. policy.

1. Control only COCOM-proscribed items

As a general policy, the United States should seek to control only the export of COCOM-proscribed items and then only when they are destined for a proscribed country or for a non-COCOM Free World country that has not entered into an agreement* to protect COCOM-proscribed technology.

2. Within COCOM, seek control on exports to third countries

With respect to COCOM, the United States should negotiate agreements with member countries regarding control of exports and reexports from their territories to third (i.e., Free World non-COCOM) countries, thereby obviating the need for U.S. reexport authorizations. For those COCOM countries with which agreement on the control of exports to third countries can be achieved, the requirement to obtain validated licenses should be eliminated—except for the export of extremely sensitive high-level technology (e.g., supercomputers). For those COCOM countries unwilling to agree to or unable to implement such controls, the present system of validated licenses should be retained.

3. Negotiate comprehensive understandings with third countries

With respect to non-COCOM Free World countries, the United States should, in coordination with other members of COCOM, negotiate *comprehensive* understandings—or equally effective informal arrangements considered acceptable by the Department of State—that specify controls on the export of all COCOM-proscribed goods and technology (including those produced indigenously) to the Warsaw Pact countries or to other noncooperating third countries. A graduated scheme of incentives should be developed for non-COCOM Free World countries that agree to less

* Such an agreement might be implemented either through a formal memorandum of understanding or an informal arrangement that achieves the same result.

than comprehensive controls. Those third countries that have agreed to comprehensive arrangements should be accorded full "COCOM-like" treatment; that is, they should not be subject to U.S.-validated license or reexport authorizations as soon as they can demonstrate their ability and willingness to enforce the control agreement.

4. Remove items whose control is no longer feasible

Regardless of the rate of progress on COCOM and third country negotiations, the United States should actively seek to remove from both the U.S. Control List and the COCOM International List items whose control is no longer feasible because of their widespread production, distribution, and sale throughout the world. (See also Item II.4 on p. 27.)

5. Maintain unilateral controls only on a temporary basis or for limited, unique national security circumstances

Regardless of the rate of progress on COCOM and third country negotiations, the United States should eliminate the use of unilateral national security export controls except in those circumstances in which active efforts are under way to negotiate multilateral controls within and outside of COCOM—in which cases unilateral controls could be maintained on a temporary basis—or in those situations in which unique national security circumstances warrant the imposition of such controls for limited periods of time. The panel wishes to emphasize, however, that the phrase "unique national security circumstances" does not justify retaining the present U.S. unilateral Control List. Rather, the panel recommends that controls be established on a multilateral basis. In the rare case in which a COCOM country may believe that critical national security concerns are at stake, it may wish to reserve the right to establish a unilateral restriction on its domestic industry. This exception should be used sparingly.

6. Eliminate reexport authorization requirements in countries participating in a community of common export controls on dual use technology

To further the objective of developing a community of common controls on dual use technology among cooperating countries of the Free World and to encourage international cooperation and trust, the United States should eliminate any requirements that a buyer must seek authorization for a reexport that is subject to COCOM or "COCOM-like" controls by the country initially exporting the product or technology. For effective enforcement, reliance should be placed instead on the cooperating governments.

7. Maintain current control procedures on the transfer within COCOM of sensitive information, technical data, and know-how

The United States should continue to rely on current security classification procedures and the protection afforded by general license GTDR (technical data restricted) or by proprietary interests to control the transfer within COCOM of information, technical data, and know-how that are considered militarily important.

8. Reduce the scope of the COCOM lists and modify COCOM decision-making policies and procedures

There are a number of steps that the United States—together with its COCOM allies—should take to improve the efficiency and effectiveness of the multilateral process. The most important of these are to reduce the overall scope of the COCOM International List to improve credibility and enforcement and to add a 4-year "sunset provision" that would cause the automatic removal (unless they were periodically rejustified) of lower-level COCOM items.

9. Maintain a clear separation between national security and foreign policy export controls

Existing statutory authority describes separate systems and procedures for the control of exports for foreign policy versus national security reasons. Therefore, because many of our COCOM allies continue to disagree profoundly with some unilateral U.S. foreign policy trade sanctions, the U.S. government should maintain the clearest possible distinction between the administration of national security and foreign policy controls.

II. ACCORD GREATER IMPORTANCE IN U.S. NATIONAL SECURITY EXPORT CONTROL DECISIONS TO MAINTAINING U.S. TECHNOLOGICAL STRENGTH, ECONOMIC VITALITY, AND ALLIED UNITY

The panel recommends that executive branch decisions concerning national security export controls accord greater importance than they currently do to maintain-

ing U.S. technological strength, economic vigor, and allied unity. Ultimately, an effective multilateral national security export control regime can be established only through the commitment and support of the President and Congress. Nevertheless, the decision-making and advisory mechanisms of government also must be constituted and tasked appropriately to facilitate the effective implementation of the policy approach proposed above. To this end, the panel recommends the following specific changes in U.S. policy and procedures.

1. Balance the protection of military security with the promotion of national economic vitality through affirmative policy direction

The President should require that the National Security Council (NSC) implement the existing policy mandate (as set forth in the Export Administration Act of 1979, as amended), which calls for both the protection of military security and the promotion of national economic interests. NSC should provide regular, affirmative policy direction to the responsible line agencies, a recommendation that can be accomplished by stating the NSC property to deal with these matters and by assigning a senior NSC staff member specific responsibility for bringing agency representatives together to resolve policy differences. The panel further recommends that the secretaries of commerce and treasury participate in NSC meetings at which export control matters are to be addressed.

2. Provide sufficient resources and authority to the Departments of Commerce and State to allow them to fulfill their roles in the export control process

To establish a more balanced policymaking process within the federal government the Departments of Commerce and State should be allocated sufficient resources dedicated to the implementation of national security export controls. In particular the Commerce Department should upgrade significantly the capacity and sophistication of its automated systems and the quality of its in-house technical and analytic expertise. It is also essential that the State Department vigorously exercise its traditional role of ensuring that the U.S. government vigorously exercise its traditional role of ensuring that the U.S. government speaks with a single, coherent voice when dealing with foreign governments and foreign firms on these matters.

3. Restore technical judgment and overall balance to the national security export licensing process

The focus of responsibility and decisionmaking within DoD has shifted from the office responsible for research and engineering to the office responsible for policy. As a result there has been a significant reduction in the weight accorded to technical factors and a resultant imbalance in the policy process. It should now be the goal therefore to reestablish a major role for the technical side of DoD and to reduce the DoD role in detailed license review as parallel steps are taken within the Commerce Department to further strengthen its licensing procedures.

4. Implement the decontrol procedures required by law when foreign availability is found to exist

The lack of action by the federal government on foreign availability determinations is contrary to the mandate of the Export Administration Act of 1979, as amended. This is due in part to the fact that no specific time lines for the completion of foreign availability determinations have been specified in legislation. At the very least the Export Administration Act should impose reasonable time lines on all responsible agencies. Because the process for determining foreign availability is not now functioning effectively, there is a need for effective remedial action by both the executive and legislative branches.

5. Withdraw the statutory requirement to integrate the MCTL into the Commerce Department's control list

Congress should withdraw the statutory requirement for the integration of the Military Critical Technologies List into the U.S. Control List. The fundamentally different nature and functions of the two lists—the former an exhaustive list of all technologies with military utility and the latter a specific list of items requiring an export license—make this goal unattainable.

6. Provide effective, two-way communication at the highest levels between government and the private sector

A mechanism should be established (or upgraded) to provide effective, two-way communication between the highest levels of government and of the private sector on the formulation and implementation of coordinated national policies that balance military security and economic vitality. To this end the panel recommends that senior policy staff of the Executive Office of the President meet periodically

with the President's Export Council and/or other respected representatives of the private sector and inform the President of the concerns of this sector regarding the domestic and international commercial impacts of national security export controls. It may be necessary for Congress to establish a mechanism to ensure appropriate consideration of industrial concerns in the formulation of national security export control policy.

7. Develop reliable data regarding the operation and impact of U.S. national security export controls

This study has revealed serious shortcomings in both the quality and quantity of information maintained and analyzed by the U.S. government on the operation of national security export controls and their domestic and international impacts. The panel recommends, therefore, that the Department of Commerce be instructed by Congress to develop and analyze such data and that the department be given sufficient resources to carry out these tasks.

8. Make more systematic use of intelligence evidence on current and anticipated Soviet acquisition efforts

The Intelligence Community should structure its efforts with regard to West-East technology transfer so as to anticipate future Soviet technology acquisition efforts. The line agencies of the U.S. government, for their part, should strive to make more systematic use of existing intelligence resources for modifying the composition of the U.S. Control List, proposing changes to the COCOM International List, and reviewing sensitive individual export licensing cases. In addition, the Intelligence Community should increase its efforts to sanitize and declassify "finished" intelligence products to provide a more informed public understanding of the technology transfer problem.

CODA

The panel notes in conclusion that there is a need for national security export controls and that current statutory authority recognizes the necessity to accommodate *both* military security and economic vitality. But the recent performance of the U.S. government on this matter has not been satisfactory—and will be increasingly less so because of prevailing trends in international trade and technology diffusion—because it has tended to focus on tightening controls while giving little attention to their effectiveness and costs. Although most of the necessary mechanisms appear to be in place, the U.S. policy process for national security export controls continues to lack proper direction and affirmative leadership at the highest level. As a result, the executive branch has failed to implement the existing provisions of law in a coherent and effective manner, which has in turn created uncertainty, confusion, and criticism both at home and abroad. In the absence of appropriate corrective measures, these continuing problems will exact ever-higher tolls—on both Western economic vitality and innovative capacity and on the military security of the United States and its allies.

APPENDIX D: COMMERCE DEPARTMENT INITIATIVES

STATEMENT BY SECRETARY OF COMMERCE MALCOLM BALDRIGE, FEBRUARY 9, 1987

Competitiveness is a long word with an even longer definition. Today, I want to deal with just one of its many elements—export controls.

Six years ago, the Reagan Administration inherited an export control system that was simply not effective. That system has been successfully restored and improved. Now our problem is not to overshoot the mark.

I don't consider the reform of the export control system we will be talking about to be an international trade off between trade and national security. I believe the reform of the system will improve both the level of U.S. competitiveness and the level of U.S. security. This is not a zero sum game. The overall security of this country is comprised of both economic and military security. One goes with the other.

Yet, in too many cases, we have seen export controls damaging the defense industrial base. We are hurting those high tech industries that we depend upon to keep our military efforts technologically superior to the Soviet Union. It is the freedom of our system that promotes research and development and we must work to keep that system as free as possible.

Our companies cannot afford to lose a contract because of bureaucratic slowdown; bureaucratic logjams or bureaucratic infighting. American companies will abide and abide patriotically by a decision to stop a shipment that may endanger our national security. We have seen this happen thousands of times. What a businessman cannot tolerate is indecision and uncertainty. With the passage of every day, foreign competitors gain advantage because they do not have the same restrictions as we do. If a U.S. exporter cannot assure his clients that he can deliver his product reliably and in a timely fashion, he simply loses his credibility and future orders.

What is happening in the international market place is a significant and growing shift away from the use of American products—a DEAMERICANIZATION of sorts. Between unilateral restrictions placed on U.S. products and bureaucratic indecision in Washington, foreign companies are moving away from purchasing current U.S. parts or designing U.S. components into future products. I have seen letters written by CEO's of major foreign companies instructing their managers to "design out" U.S. parts from their product. This is being done to eliminate these companies from being bound by U.S. reexport regulations and other unilateral restrictions that accompany our products throughout the world.

Over the years, the costs imposed on U.S. industries have become excessive and the burden too much to overcome in too many cases. As the department in charge of balancing U.S. security needs and export controls, the Commerce Department is undertaking some major reforms and improvements to the process, and has forwarded to the White House significant legislative and administrative changes to carry them out. We have also taken major internal steps to assure more timely and efficient review of export licenses.

First, on January 20, 1987, we eliminated foreign policy controls on exports of oil and gas equipment to the Soviet Union. The economic burden of these controls clearly outweighed their intended benefits. This action indicated to the exporting community that we will not allow controls to be continued that impose excessive and unnecessary costs on U.S. industry.

Second, we are proposing two new general licenses that reduce the licensing burden for U.S. exporters. I am today sending appropriate agencies and Congressional leaders draft regulations to go forward with elements of the certified end user plan proposed earlier. As a first step, we made available a broadened general license G-CEU available for enterprises controlled by Coordinating Committee on Export Controls (COCOM) governments. We expect to expand this in the future to other enterprises in COCOM countries. We will also be recognizing the trust and shared responsibility in COCOM by introducing a new general license that removes virtually all restrictions on exports to governmental agencies in these countries.

Third, in the future we will extend this general license, and other procedures now reserved for our COCOM partners, to other free world countries that establish adequate export control programs.

Fourth, these actions will be followed within the next few weeks by significant revisions in our parts and components requirements—which we hope will address the DEAMERICANIZATION concern I mentioned.

Fifth, we will eliminate licensing requirements for low-level exports to our non-COCOM trading partners in the free world.

Sixth, we are developing regulations to remove or eliminate prior U.S. authorization for reexports into COCOM countries.

Seventh, on foreign availability we have proposed legislation to the White House to provide specific deadlines for foreign availability determinations and provide a more precise definition of foreign availability. Other agencies will be consulted, but the proposed legislation makes clear that the Secretary of Commerce does not need other agencies' approval to make a decision.

Eighth, we are also proposing legislation that when a product or technology similar to a U.S. product is available to a free world country without restrictions, that U.S. product qualifies for a license to a free world country. This license will be granted in 20 days unless an unacceptable risk of diversion is demonstrated.

Ninth, in a separate provision in our legislative package, we will provide authority to allow for exports to the People's Republic of China under the distribution license.

Tenth, this year we will meet the President's goal of reducing license times by one third—from 20 to 14 days. From 1985 to 1986 we reduced licensing times from 30 days to 20 days. Licenses for our major trading partners (COCOM) are processed in about 7 days.

Eleventh, we are working with other agencies to improve the way we manage the process. We clearly need to do more to settle interagency disputes. For too long the bickering in Washington has been one more unfair trade barrier interfering with the flow of legitimate trade. Temporary swings of mood, in organizations or individuals should not be allowed to impede the long-term decision making of our business leaders. We know controls have costs, and when national security is truly at stake, industry is willing to bear those costs. But as our business leaders fight it out in international markets, they have to know that Washington is there to support them—not cut them off at the knees. The controls must be rational and predictable and the decision making process must be managed constructively, not destroyed through bureaucratic obstructions.

And, finally, we should always recognize that no export control program will be successful without international cooperation. For this reason, we have been hard at work with COCOM. They desire a shortening of the list to eliminate insignificant items; we want more effective controls on the more important items. I feel sure we will be able to work out these objectives successfully.

The recent National Academy of Sciences report, written by a panel comprised of a former secretary of defense, two former National Security Agency directors, a former secretary of the Air Force, and other defense and production experts and business leaders, backs Commerce's conclusions, laying out the issues in a straightforward manner. Most importantly the President has recognized the importance of improving the export control program as one of his goals in the State of the Union message.

There is no one key to opening the door marked "Competitiveness"—there are a great many keys and a great many doors. In taking the steps I've outlined today, we will have cut our license applications by 20 percent. And we have also greatly improved another very important key—the reliability that the U.S. government and its companies have as we compete in international markets.

GENERAL LICENSE CEU AND GCG FACT SHEET, FEBRUARY 9, 1987

A new general license, General License Cooperating Governments (GCG), provides for virtually unrestricted exports to national government agencies in cooperating countries. Initially, this will be restricted to COCOM countries, with other destinations added as they develop adequate export control regimes. This reflects our confidence in these cooperating countries to safeguard U.S. goods.

A general license for certified end-users (G-CEU) is a refinement of an earlier proposal.

It establishes a category of certified end-user (CEU). Initially, only enterprises effectively controlled by cooperating governments will be eligible.

CEU's in COCOM countries will be eligible to receive virtually all U.S. goods. We will continue to expand the list of countries.

CEU's will be able to use the goods in their own facilities, transfer them to other CEU's, or incorporate them into products that will be distributed within cooperating countries.

The Department is exploring ways to expand the general license or take other action to relieve the licensing burden on shipments to non-government controlled enterprises. Measures to follow shortly include:

eliminating the requirement for reexport authorization for shipments into COCOM.

allowing low-level strategic goods to go to all free world countries under general license. Exceptions will be countries to which trade is restricted for foreign policy reasons. Currently they can go only to COCOM countries.

Relaxing our policy on use of U.S. components in foreign products.

The combination of these actions will reduce the total number of licenses by about 20% (total licenses per year, approx. 120,000).

THE WHITE HOUSE,
OFFICE OF THE PRESS SECRETARY,
March 18, 1987.

The White House today sent to the Congress a series of proposed steps to streamline the Government's export control procedures for high technology items. These proposals are part of the President's energetic program to enhance America's competitiveness in the world economy. This nation's ability to export its high technology products and services is central to our ability to compete. At the same time, we remain mindful of aggressive Soviet efforts to acquire Western technology. Soviet successes in this area have contributed directly to Soviet military capability and have cost the American taxpayer dearly as the U.S. seeks to maintain its technological lead.

The proposals submitted today will simplify export procedures and eliminate administrative burdens on U.S. exporters. They include the exemption from license requirements of a number of low technology items which should reduce the total number of export license applications by almost 10 percent. The proposals will also eliminate the need for re-export authorization to Coordinating Committee for multi-lateral export controls (COCOM) countries, and will put in place a certified end-user program whereby COCOM country government-related enterprises will not need validated export licenses. Another proposal will allow foreign manufacturers to re-export U.S. parts and components up to a certain level without U.S. Government re-export authorization. The Administration looks forward to working with the Congress in the export control system in a way that meets the needs of American exporters, and protects our fundamental national security interests.

EXPORT CONTROLS AND COMPETITIVENESS OUTLINE OF ADMINISTRATION POLICY INITIATIVE

INTRODUCTION

We have made significant strides over the past six years in stemming the flow of Western technology to the Soviets. Thanks to our export control program, we have made it increasingly difficult for the Soviets to obtain—legally or illegally—leading Western technology. We no longer see turnkey plants being sold to our adversaries. The United States has also expanded its technological lead over the Soviets in several key areas. In short, our efforts to date have corrected the initial deficiencies that the Administration found in the process.

A balance must be struck that will protect national security without impeding legitimate trade. This is particularly necessary in these days of intense global competition where it has become abundantly clear that national security has two components: military security and economic security. To bring about this balance, the National Security Council has conducted a month-long review of our export control system with all pertinent agencies of the Executive branch participating.

I. Legislative proposals

The Administration has submitted several legislative proposals to enhance national security as well as our competitiveness through improvements in the export control program. These are as follows:

A. Foreign availability

1. *West-West trade.*—Section 4606 of the Administration's bill provides a less stringent definition of "foreign availability" in the West-West context, leading to expedited licensing, not decontrol. Thus, when a licensable product is available to a free world country from foreign sources without restriction, a license for this product would automatically be granted within 20 days (with a 15-day extension possible) unless an unacceptable risk of diversion is demonstrated.

West-East trade.—Under this provision, there would be specific deadlines (120 days) to complete foreign availability determinations involving controlled countries. Commerce will only be required to "consult" with other agencies instead of being required to obtain their prior approval. We expect this to bring about systematic and recurring foreign availability findings. The President will, of course, retain the authority for a national security override.

B. COCOM negotiating objectives

This provision of the Administration's legislative package would establish, in recognition of the ineffectiveness of unilateral controls, that the official U.S. negotiating objectives at COCOM would include (a) paring back of the COCOM international control list, (b) seeking greater commitment of our COCOM allies to pursuing cooperation from Third countries, and (c) seeking greater enforcement of COCOM controls by member governments.

C. China

Section 4603 of the Administration's bill would establish clear authority for the Secretary of Commerce to issue distribution licenses for appropriate exports to the PRC.

D. Enforcement

1. We are seeking authority to curtail sales in the United States of controlled items to commercial entities that are operated by controlled countries. (Section 4604)

2. Section 4608 would allow the Secretary of Commerce to prohibit persons or firms convicted of violating the EAA or IEEPA from receiving export licenses.

3. Section 4609 would give Commerce authority to provide a temporary denial of a license in order to prevent an imminent violation or where otherwise necessary to facilitate enforcement of the EAA.

II. Regulatory changes

A. Low tech exports

Draft regulations are currently circulating for interagency review that would eliminate the need for exporters to obtain a validated export license for shipments of certain low tech items to most free world destinations. These changes, when promulgated, should reduce the total number of export license applications currently submitted by almost 10 percent. Such new procedures would not alter licensing requirements for the export of such items to the Soviet Bloc and other COCOM-prescribed destinations. Rather, they would be issued pursuant to authority of the Secretary of Commerce under the EAA regarding West-West trade. A Notice of Proposed Rule-making was published in the *Federal Register* on March 19 and final rules can be expected on or about May 1, as follows:

1. For trade with COCOM, these changes would expand the list of low-level U.S.-origin dual use items available for export without a validated license from the U.S. to a COCOM country (or between COCOM countries). As such, the new list would include all Administrative Exception Note ("AEN") items; i.e., those commodities on the COCOM control list that each COCOM member can approve for export to controlled countries with only notification to the other 15 COCOM governments.

2. For trade with 80 additional free world countries, these changes would allow the lower level of AEN items (currently available for trade with COCOM under the G-COM procedures) to be exported without a validated license. Export of these lower level items is routinely permitted by the United States and by its COCOM allies. Moreover, exports to countries which pose certain nuclear concerns or other foreign policy concerns will not be eligible for the special treatment of these procedures.

B. Re-export authorization

Regulations are currently being drafted, for publication as final rules by June, that would allow foreign companies that have lawfully obtained U.S. controlled commodities to re-export such commodities to a customer in a COCOM country without having to obtain U.S. Government re-export authorization. Some consider-

ation is also being given to dropping U.S. Government re-export authorization requirements on re-exports from COCOM countries to non-COCOM Supplement 2 and 3 destinations.

C. Certified end-user program

In the *Federal Register* of February 20, the Commerce Department announced two new general licenses that allow COCOM country governmental entities and enterprises controlled by them to receive U.S. origin exports without the exporter needing a validated license. These new general licenses are viewed by the Administration as only the first steps that can be taken as part of the concept of certifying those foreign end users found by the Commerce Department to be patently reliable.

D. Parts and components

Final regulations can be expected by early April that will allow foreign manufacturers to incorporate certain levels of U.S.-origin parts and components into their manufactured end-products without such manufacturers having to obtain re-export authorization from the U.S. Government. The proposal currently circulating for interagency clearance would provide exemptions from control if U.S.-origin content does not exceed 25% of the value of the end product and the destination of the end-product, when sold, is a country listed in Supplement 2 or 3 to Part 373 of the Export Administration Regulations (excluding Ethiopia, Lebanon and Nicaragua). Exemptions from control would also be provided if U.S.-origin content does not exceed 10% and \$10,000 in cases involving sales to destinations not listed in Supplements 2 or 3.

Nothing in this rule authorizes any exemptions whatsoever from license requirements for direct exports from the United States to any country of U.S.-origin parts, components and materials.

The parts and components regulations do not apply to exports from a foreign country of foreign-made supercomputers containing U.S.-origin parts, components or materials.

III. Administration improvements

A. Unilateral controls

The NSC will coordinate an interagency study that will re-examine: (i) all export controls unilaterally-imposed by the United States and (ii) the degree to which the U.S. Government implements COCOM control policies and procedures more restrictively than do the COCOM allies (e.g., as to medical equipment). In a period not to exceed three months, the group will take steps to (i) eliminate all controls found by them no longer to meet statutory criteria or no longer to be in the national interest, and (ii) to start processing export license cases in accordance with policy interpretations that are on a parity with those of our allies.

B. Liberalization of trade with the People's Republic of China (PRC)

The United States will work with COCOM to expand the "Green Zone" of high tech commodities that can be exported to the PRC with only the approval of an individual member country. In the meantime, certain administrative steps are necessary in order to carry out the President's mandate in conjunction with the State of the Union message that high tech trade with the PRC be further liberalized.

Specifically, the Commerce Department is preparing regulations that will (i) amend the General License for Temporary Export (GTE) to allow controlled commodities to be exhibited at trade shows in the PRC, even if licensing policy would not permit issuance of validated license for export of the commodity; and (ii) expressly provide that the Project License is available for exports to the PRC.

Furthermore, we have determined that it is not in the interest of the United States for our government to interpret the "Green Zone" and other COCOM controls more restrictively than has been agreed to at COCOM. Accordingly, we will propose guidelines that direct all export license cases for the PRC be processed by the Commerce Department in accordance with policy interpretations that are on a parity with those of our allies.

C. License processing

1. *Reduction in processing time.*—The President has directed that the time for exporters to acquire a license be reduced by one-third. Last year, we reduced average overall license processing times from 30 days to 20 days. Export licenses for our major trading partners (COCOM) are processed in about 7 days, well below the statutory requirement of 15 days. Our goal is to further reduce the average license processing times from 20 days to 14 days.

2. *Expedited case resolution.*—Producers will be established to ensure that export control cases be brought to closure within very reasonable periods of time.

D. Additional automation of the export licensing system

The recent interagency reviewed has produced a number of proposals for an automated license processing system that will allow license applicants to transmit electronically their license applications to Commerce for quick review. These automation proposals are presently being analyzed. A specific proposal that meets policy concerns and stays within present budget guidance will be drafted in the coming weeks.

THE WHITE HOUSE,
Washington, March 18, 1987.

Hon. DANTE B. FASCELL,
House of Representatives,
Washington, DC.

DEAR MR. CHAIRMAN: The President has presented to the Congress a strong and energetic program to enhance America's competitive position in the world economy. This nation's ability to export its high technology products and services is central to our ability to compete. At the same time, we must remain mindful of Soviet and East European efforts to acquire Western technology. Soviet successes in these endeavors in the past have contributed directly to the Soviet military machine, and cost the American taxpayer dearly as the United States seeks to maintain its technological lead. The Administration is in the process of reviewing its current export control procedures with a view to strengthening those procedures, and to eliminating administrative burdens on U.S. exporters.

We are pleased to report that we intend to make a series of regulatory changes which will accomplish these objectives. An outline of the Administration's policy initiative is attached. We look forward to working with the Congress in developing an export control system that meets the needs of American exporters, and protects our fundamental national security interests.

Sincerely,

JAMES C. MILLER III,
Director,
Office of Management and Budget.
FRANK C. CARLUCCI,
Assistant to the President for National Security Affairs.

APPENDIX E: ESTIMATES OF ECONOMIC COSTS: A CRITICAL REVIEW

1. ESTIMATE OF SALES IMPACT APPEARS HIGH

The quantitative analysis presented in the NAS report bases the estimates of the impact of export controls on a case study in analytic instruments. The direct cost impact was assumed to be a decrease in sales of 10%. However, a decrease in sales of less than 7% seems more consistent with the available data.

The cause and effect relationship developed in the NAS report is associated with the analytic instruments case and is described as follows:¹

An analysis commissioned by the panel indicates that when controls were relaxed early in 1984, U.S. analytic instrument exports increased (by the third quarter of 1984) roughly 7 percent over what they would have been without change. Using the same assumptions and adjustments the analysis shows that when the relaxation was reversed in late 1984, exports by the third quarter of 1985 were 12 percent below what they would have been if licensing requirements had not been reimposed.

The rationale for the figure of 10% is, "For the purpose of this analysis, a value of 10 percent was used as a measure of lost sales—the mid range of the analytic instruments case."²

Apart from the analysis provided in the text of the NAS report, another method of estimating the impact of national security export controls is to compare export sales data from related product groupings. Such a review provides not only a sense of sales trends for a particular product category, but also insight to major economic trends.

Table E-1 summarizes exports of electronic products by industry groupings in the years from 1982 to 1986. For example, sales in consumer electronics in 1984 surpassed those of 1983 by 113%, while a decline of 6.3% was experienced in 1985 with respect to 1984 levels. Interestingly, all but one product group realized significant export sales increases, comparing 1984 levels to 1983 levels, and slowed or negative growth comparing 1985 sales to those in 1984. Communications products were an exception to this trend in that they experienced increased growth in 1985, due in some part to the impact of the 1984 AT&T divestiture and the resultant pursuit of international sales. Commodities, subject to high volume competition and cost sensitivity, such as solid state semiconductors and consumer electronics experienced strong declines in 1985 with respect to 1984 sales. Analysts ascribe much of this decline to the increased dollar value in this period.

Industrial products, of which scientific instruments are a subgroup experienced sales growth of 18.9% in 1984 (over 1983) and 1.1% in 1985 (over 1984). However, the entire electronics aggregate experienced a 2.4% decline in sales from 1984 to 1985. Table E-2 summarizes quarterly export sales data for scientific instruments (CCL category 711, schedule B-commodities), this grouping consisting of a superset of those products used as the study group in the analysis presented in the NAS report. From 1983 to 1984, sales increased by 4.3%, slowing to a 0.56% growth rate in 1985. Table E-3 displays the equivalent data for those scientific instruments forming the subset employed in the quantitative analysis in the NAS report. Interestingly, a growth rate of 2.8% from 1983 to 1984 was realized, while a decline of 1.0% was observed, comparing 1985 to 1984. Clearly, the greater growth and decline of the study group as compared to the products of schedule B CCL 711 suggests the potential impact of export controls.

Table E-4 compares changes in sales for the schedule B commodities of category 711 with the NAS report study group subset over a minimum of three 9 month periods, as follows: Period 1, third quarter of 1983 through the first quarter of 1984;

¹ "Balancing the National Interest," National Academy Press, Washington, DC, 1986, pp. 248-249.

² Ibid, p. 271.

Period 2, second quarter of 1984 through the fourth quarter of 1984; and Period 3, first quarter of 1985 through the third quarter of 1985. It should be noted that Period 1 corresponds to a period of U.S. unilateral control of the study group while Period 2 is associated with decontrol, occurring in April 1984. Period 3 comprises the 9 months following the December 1984 reinstatement of COCOM controls for the study group. The data shows that the group subject to unilateral control experienced a 7.3% sales growth in Period 2 as compared to Period 1. At the same time, the larger grouping (schedule B, commodities 711) experienced only a 2.9% increase. Given that the controlled items represented roughly 38% of the larger set, then the study group (controlled) items realized roughly a 7% increase in sales relative to other items in this product grouping, not controlled. Other factors such as the possibility of pent up demand for the controlled products or nature of the competition might also contribute to relative differences in sales growth in this period, however.

The transition from period 2 to period 3 (associated with control reinstatement) evidences a sales growth of 1.08% in the larger category of 711 commodities, whereas the sales growth of the study group realized only a 0.06% sales increase. This suggests that the uncontrolled products saw growth on the order of 1.7% relative to the controlled items in the study group.

Hence, if an averaging scheme as suggested in the NAS report was employed to estimate the relative impact of export controls, the resultant increase would be on the order of 4%. The assertion in the NAS report that suggests that sales of the study group would have been 12% higher, that is, achieved 12% higher sales in 1985 than in 1984 is inconsistent with the trends of declining sales growth rates in this period throughout the electronics industry, and is unsubstantiated by the available data.

One potential cause of this counter-intuitive prediction lies in the use of production indices in the regression analysis described in the Academy's report. Supposedly, the production indices were employed to estimate an economic activity level, i.e. a propensity for foreign consumption. However, production levels are usually generated by forecasts of sales far in advance. Hence a down turn in sales may result in production cuts 9 months after the fact. It is interesting to note that the production indices of Table E-5 evidence precisely this phenomena. That is, despite the precipitous down turn in sales in 1985, production indices continued to climb through 1985. Use of aggregated sales figures would have provided a more realistic estimation of sales propensity. It should be noted that U.S. imports also realized significantly slower growth from 1984 to 1985 than in the period of 1983 to 1984 across the electronics industry.

Finally, the chronology excerpt of Appendix F of this report points out that the 7% increase in sales was experienced as a result of the transition from U.S. unilateral control to decontrol, whereas the 12% decrease, was associated with imposing multilateral control. It must be noted that multilateral controls, imposed by the agreement of COCOM nations, do not represent the competitive disadvantage associated with unilateral U.S. control (i.e. where the U.S. controls a product and other nations do not). The averaging of these two numbers, representing distinctly different mechanisms, may be inappropriate. Moreover, no evidence was offered verifying the assertion that the controls were not multilaterally applied, nor was concern registered regarding why the COCOM countries agreed to the controls but did not uniformly administer them.

Furthermore, the 10 percent loss of sales figure was applied to other categories of manufactures, weighted by the impact* of destination and criticality. Again, only categories for which unilateral controls or unusual delays with respect to competition would result in relative penalty to U.S. manufacturers should have been considered. It is unclear that decisions against purchase are equally likely in all technologies independent of the competition outlook.

2. POSSIBLE ERROR IN JOB LOSS CALCULATION

The 188,000 lost jobs estimated by Quick, Finan and Associates was predicated upon a conversion factor from sales to lost jobs which may not be appropriate for assessing job loss resulting from changes in sales.

* Products shipped to some destinations and with certain technologies may be affected to a greater degree than others. Nations with greater risk of diversion or highly critical technologies would be impacted to a greater extent.

The job loss calculation of the Academy report assumed a loss of \$7.3 billion in exports and a conversion factor of 25,800 jobs lost per \$1 billion of exports. This conversion factor is based on an input/output analysis by Lester Davis.^{3, 4}

However, in Appendix G of this report, Lester Davis states about his figure for export related employment that, "neither the totals nor the average employment rates per billion dollars of exports should be used for also estimating changes in employment, that is, if exports were higher or lower than actually occurred."

For this reason an alternative check on estimating job loss was sought. One lower bound may be obtained by determining the typical necessary sales volume which U.S. industries require to support an employee. Appendix H displays aggregated sales per employee quotients ranging from \$63,000 to \$133,000. This table represents data on numerous high tech firms. These sales per employee quotients are in contrast with the number used in the analysis, \$38,800/employee.

Hence, the relationship of jobs lost per dollar of sales employed in the NAS report appears to be less than half the expected when considering an analysis of the margin. Using the factors of 4 percent (discussed in item 1 above) and a conversion of \$108,400 sales per employee,⁵ the resultant job loss estimate would be only 34,600. However, employing the figure of \$133,000 sales per employee of appendix G results in a job loss estimate of only 28,200. For these reasons, job loss estimates of 15 to 20 percent of the 188,000 reported by the Academy may have been more reasonable.

The Committee again observes that the National Academy of Sciences Panel presented and disseminated this result in its report, but "emphasized that the panel did not base its findings or recommendations on these estimates."

TABLE E-1.—EXPORTS OF ELECTRONIC PRODUCTS BY INDUSTRY

(Dollar amounts in thousands)

Product group	1982	Percent	1983	Percent	1984	Percent	1985	Percent	1986
Communications products...	\$2,621,384	3.4	\$2,710,087	5.7	\$2,867,217	11.1	\$3,185,409	4.3	\$3,323,733
Consumer electronics	544,173	-1.0	489,385	113	1,042,525	-6.3	976,549	19.4	1,166,130
Electron tubes	313,160	-1.4	308,810	12	345,781	6.7	368,883	15.45	425,881
Electronic parts	1,973,118	14.3	2,254,468	16	2,614,316	-6.0	2,458,103	11.6	2,742,976
Industrial products	14,959,872	10.1	16,477,766	18.9	19,583,904	1.1	19,795,126	5.7	20,921,423
Solid state products	3,789,334	15.1	4,360,978	22.3	5,333,082	-20.5	4,242,049	14.8	4,870,971
Total	24,201,041		26,601,495		31,786,826		31,026,118		33,451,115
Other	78,766		75,328						
Grand total	24,279,807	9.9	26,676,823	19.2	31,786,826	-2.4	31,026,118	7.6	33,451,115

Source: EIA Market Data Book—1987.

TABLE E-2.—SCIENTIFIC INSTRUMENTS (711) EXPORT SALES

(Dollar amounts in thousands)

Quarter	1983	Percent	1984	Percent	1985	Percent	1986	Percent	1987
First	\$566,775		\$566,439		\$621,183		\$592,670		\$604,887
Second	520,856		564,017		578,434		558,901		692,170
Third	546,823		566,033		541,699		580,312		
Fourth	560,984		592,675		560,777		611,169		
Total	2,195,438	4.3	2,289,164	0.56	2,302,093	1.8	2,343,052		

Source: U.S. Department of Commerce official statistics.

³ Davis, Lester, "Contributions of Exports to U.S. Employment: U.S. Trade Performance in 1985 and Outlook." U.S. Dept. of Commerce, October 1986, pp. 92-94.

⁴ Davis, Lester, "Contributions of Exports to U.S. Employment." U.S. Dept. of Commerce, March 1986.

⁵ The figure of \$108,400 sales per employee has been used by the Semiconductor Industries Association. See "U.S. Chip Makers Give Mixed Review To Trade Pact", by S. Auerbach. The Washington Post, September 22, 1987. This figure is also consistent with the aggregated company sales data of Appendix G.

TABLE E-3.—STUDY REFERENCE GROUP EXPORT SALE FIGURES

[Dollar amounts in thousands]

Quarter	1983	Percent	1984	Percent	1985
First	\$230,259		\$222,420		\$241,449
Second	195,708		220,917		223,380
Third	199,281		220,467		212,100
Fourth	208,788		235,146		212,979
Total	834,036	7.8	898,950	-1.0	889,908

Source: Quick, Finan and Associates, November 17, 1987.

TABLE E-4.—EXPORT SALES GROWTH COMPARISON (CCL 711 SCHEDULE B)

[Dollar amounts in thousands]

Grouping	3Q83 to 1Q84	Percent	2Q84 to 4Q84	Percent	1Q85 to 3Q85
CCL 711 scientific instruments	\$1,674,246	2.9	\$1,722,725	1.08	\$1,741,316
Study group	\$630,487	7.3	\$676,530	0.06	\$676,932

TABLE E-5.—COCOM INDUSTRIAL PRODUCTION INDICES

Quarter	1983	Percent	1984	Percent	1985
First	106.42		112.92		116.73
Second	107.17		112.36		118.68
Third	108.9	5.6	115.03	3.8	119.43
Fourth	110.89		116.13		

Source: Quick, Finan and Associates, November 17, 1987.

APPENDIX F: SCIENTIFIC INSTRUMENTS CHRONOLOGY

April 1984: The Department of Commerce publishes in the *Federal Register* an announcement that it will no longer require export licenses for a wide range of laboratory and analytical instruments incorporating microprocessor-based controls. According to the Commerce Department announcement, this change in export licensing requirements would eliminate 2,500 cases from the present system. Not affected by this announcement were automated process control equipment, automated test equipment and data acquisition systems. Thus, out of approximately 200 categories of instrumentation unilaterally controlled by the U.S. under CCL 4529B, the Commerce action frees about 100 categories of instruments.

June 1984: SAMA files comments on the Commerce Department's *Federal Register* decontrol proposal. SAMA notes that the decontrol effort will have a limited benefit to its members and that the products which are being decontrolled are 5-6 years old. SAMA also notes that it is aware that negotiations are underway at COCOM on the subject of instrumentation and essential computer technology.

July 1984: Commerce furnishes SAMA with the text of the COCOM agreement on instrumentation and embedded and associated computer technology. SAMA's preliminary analysis is that the COCOM agreement would require export licenses for many of the products decontrolled by the Commerce Department in April.

Dec. 31, 1984: Commerce Department issues new COCOM Regulations that would require an export license for any product that cannot meet the definition of "embedded" as it applies to equipment manufactured by SAMA members, without releasing truly general purpose computer boards.

Source: "Analysis of the Effects of U.S. National Security Export Controls on U.S. Headquartered Industrial Firms", Volume 2, National Academy Press, August 1986, Appendix B.

APPENDIX G: APPLICABILITY OF INPUT/OUTPUT ANALYSIS



UNITED STATES DEPARTMENT OF COMMERCE
International Trade Administration
Washington, D.C. 20230

June 16, 1987

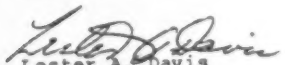
Kevin Kennedy
Committee on Science, Space and
Technology
House Annex 1, Room 820
U.S. Congress
Washington, D.C. 20515

Dear Mr. Kennedy:

The following is in response to your question on the phone on June 16: Could the data in my report "Contribution of Exports to U.S. Employment" be used for estimates at the margin? As I indicated--the answer is no.

As indicated in the report (page 20, paragraph 2) the estimates of export-related employment are the sum of the employment directly and indirectly required to domestically produce goods and services. The estimates are annual and therefore are the employment required in each year. Neither the totals nor the average employment rates per billion dollars of exports should be used for also estimating changes in employment, that is, if exports were higher or lower than actually occurred.

Sincerely,


Lester A. Davis
Office of Trade and
Investment Analysis
Room H-2217
(202-377-4924)

Attachment



APPENDIX H: INDUSTRY ANALYSIS—SALES PER EMPLOYEE

[Dollars in millions]

Sector and company	Sales	Number of employees
Top 15 companies in R&D expenditures:		
IBM.....	\$45,623	394,932
GM.....	83,135	748,054
ATT.....	53,818	364,982
Ford.....	51,757	383,691
Dupont.....	35,387	157,774
GE.....	28,054	329,943
United Tech.....	16,323	205,482
Kodak.....	10,608	123,891
Exxon.....	90,854	150,020
Dec.....	5,584	85,641
HP.....	6,044	81,994
Xerox.....	8,792	103,391
ITT.....	12,683	251,938
DOW.....	11,523	49,799
Boeing.....	10,204	91,895
Total.....	470,389	3,523,426
[133,503] SALES PER EMPLOYEE AGGREGATE		
Semiconductors:		
AMD.....	583	13,024
INTEL.....	1,629	25,405
TI.....	5,741.6	86,557
VLSI.....	69.5	629
XICOR.....	39.0	687
Total.....	8,062.1	126,301
[63,330] SALES PER EMPLOYEE AGGREGATE		
Top 15 spenders on R&D percent of sales (13.2 percent):		
Dysan.....	214.1	3,398
ADAC.....	59.3	752
Hogan.....	36.4	397
VLSI.....	69.5	629
XICOR.....	39.0	687
Policy Mgmt.....	84.8	1,424
Mgmt. Sci.....	141.8	1,964
Applied Mat.....	168.4	1,473
AMD.....	583.3	13,063
TeleSciences.....	64.9	667
Genrad.....	249.5	3,402
Computer Console.....	131.2	1,638
Crav.....	228.8	2,201
Amdahl.....	779.4	6,800
Applied Data Res.....	128.2	1,500
Total.....	2,978.6	39,995 ¹
[74,474] SALES PER EMPLOYEE AGGREGATE		